Royal United Hospitals Bath
NHS Foundation Trust

AKI

Current Awareness Bulletin

October 2024

Our Current Awareness Bulletins provide details of recently published articles in a given subject. They are a quick and easy way to keep up to date.

Please contact the Academy Library to request any articles:

ruh-tr.library@nhs.net

01225 82 4897/4898

Carry out basic searches using the Knowledge and Library Hub.

Sign up to NHS OpenAthens to access our subscriptions.

Contact us to receive our bulletins via email each month.

Get personalised alerts via our KnowledgeShare service.

ruh.nhs.uk/library

1. **Association of corticosteroid therapy with reduced acute kidney injury and lower NET markers in severe COVID-19: an observational study.**

Authors: Bulow Anderberg, Sara;Huckriede, Joram;Hultstrom, Michael;Larsson, Anders;de Vries, Femke;Lipcsey, Miklos;Nicolaes, Gerry A. F. and Frithiof, Robert

Publication Date: Sep 28 ,2024

Journal: Intensive Care Medicine Experimental 12(1), pp. 85

Abstract: BACKGROUND: Acute kidney injury (AKI) is common in critical cases of coronavirus disease 2019 (COVID-19) and associated with worse outcome. Dysregulated neutrophil extracellular trap (NET) formation is one of several suggested pathophysiological mechanisms involved in the development of COVID-19 associated AKI. The corticosteroid dexamethasone was implemented as a standard treatment for severe COVID-19 as of June 2020. A sub-analysis of a prospective observational single center study was performed to evaluate the effect of corticosteroid treatment on AKI development and NET markers in critical cases of COVID-19. RESULTS: Two hundred and ten adult patients admitted to intensive care at a tertiary level hospital due to respiratory failure or shock secondary to SARS-CoV-2-infection between March 13th 2020 and January 14th 2021 were included in the study. Ninety-seven of those did not receive corticosteroids. One hundred and thirteen patients were treated with corticosteroids [dexamethasone (n = 98) or equivalent treatment (n = 15)], but the incidence of AKI was assessed only in patients that received corticosteroids before any registered renal dysfunction (n = 63). Corticosteroids were associated with a lower incidence of AKI (19% vs 55.8%, p : Two hundred and ten adult patients admitted to intensive care at a tertiary level hospital due to respiratory failure or shock secondary to SARS-CoV-2-infection between March 13th 2020 and January 14th 2021 were included in the study. Ninety-seven of those did not receive corticosteroids. One hundred and thirteen patients were treated with corticosteroids [dexamethasone (n = 98) or equivalent treatment (n = 15)], but the incidence of AKI was assessed only in patients that received corticosteroids before any registered renal dysfunction (n = 63). Corticosteroids were associated with a lower incidence of AKI (19% vs 55.8%, p : Two hundred and ten adult patients admitted to intensive care at a tertiary level hospital due to respiratory failure or shock secondary to SARS-CoV-2-infection between March 13th 2020 and January 14th 2021 were included in the study. Ninety-seven of those did not receive corticosteroids. One hundred and thirteen patients were treated with corticosteroids [dexamethasone (n = 98) or equivalent treatment (n = 15)], but the incidence of AKI was assessed only in patients that received corticosteroids before any registered renal dysfunction (n = 63). Corticosteroids were associated with a lower incidence of AKI (19% vs 55.8%, p : Two hundred and ten adult patients admitted to intensive care at a tertiary level hospital due to respiratory failure or shock secondary to SARS-CoV-2-infection between March 13th 2020 and January 14th 2021 were included in the study. Ninety-seven of those did not receive corticosteroids. One hundred and thirteen patients were treated with corticosteroids [dexamethasone (n = 98) or equivalent treatment (n = 15)], but the incidence of AKI was assessed only in patients that received corticosteroids before any registered renal dysfunction (n = 63). Corticosteroids were associated with a lower incidence of AKI (19% vs 55.8%, p CONCLUSION: Corticosteroid treatment in severe COVID-19 is associated with a lower incidence of AKI and reduced concentrations of NET markers in plasma.

---

2. **Association Between Influenza Vaccination and Acute Kidney Injury Among the Elderly: A Self-Controlled Case Series.**

Authors: Cho, Haerin;Lim, Eunsun;Kim, Hee-Jin;Jeong, Na-Young and Choi, Nam-Kyong

Publication Date: Sep ,2024

Journal: Pharmacoepidemiology & Drug Safety 33(9), pp. e70006

Abstract: BACKGROUND: Several cases of renal complications, including acute kidney injury (AKI), after

influenza vaccination have been reported, but the association remains unproven. We evaluated the association between influenza vaccination and AKI occurrence among the Korean elderly in the 2018-2019 and 2019-2020 seasons. METHODS: We used a large database combining vaccination registration data from the Korea Disease Control and Prevention Agency and claims data from the National Health Insurance Service. The study subjects were patients hospitalized with AKI for the first-time following vaccination among those who received one influenza vaccine in the 2018-2019 or 2019-2020 season. Only those aged 65 or older at the date of vaccination were included. We performed a self-controlled case series study, designating the risk period as 1 to 28 days post-vaccination and the observation period as each influenza season. The adjusted incidence rate ratio (aIRR) was calculated by adjusting for nephrotoxic drug use and influenza infection that may influence AKI occurrence using a conditional Poisson regression model. RESULTS: A total of 16 713 and 16 272 AKI events were identified during the 2018-2019 and 2019-2020 seasons, respectively. The aIRR for AKI was 0.83 (95% confidence interval [CI] = 0.79-0.87) in the 2018-2019 season. The aIRR for the 2019-2020 influenza season was similar to the 2018-2019 season (aIRR = 0.86; 95% CI = 0.82-0.90). CONCLUSIONS: Influenza vaccination is associated with a lower risk of AKI in the elderly over 65. This evidence supports the recommendation of annual influenza vaccination for the elderly. Further studies are needed to determine the biological mechanisms linking the influenza vaccine and AKI.

---

3. **IL-17A Levels and Progression of Kidney Disease Following Hospitalization with and without Acute Kidney Injury.**

Authors: Collett, J. A.;Flannery, A. H.;Liu, L. J.;Takeuchi, T.;Basile, D. P. and Neyra, J. A.

Publication Date: 2024

Journal: Kidney360

Abstract: BACKGROUND: Acute kidney injury (AKI) is associated with increased mortality and new or progressive chronic kidney disease (CKD). Inflammatory cells play an important role in acute organ injury. We previously demonstrated that serum IL-17A levels were significantly elevated in critically ill patients with AKI and independently associated with hospital mortality. We hypothesize that IL-17A levels are elevated in hospitalized patients with AKI at diagnosis, and sustained elevation after discharge is associated with subsequent CKD incidence or progression. METHOD(S): Observational convenience sampling study of hospital survivors of Stage 2 or 3 AKI and controls without AKI from the ASSESS-AKI study. Patients were classified as progression or non-progression based on a composite of CKD incidence, progression, or end-stage kidney disease. IL-17A levels were evaluated with S-Plex assay (MSD) at 0- (during hospitalization), 3- and 12-month post-discharge, and analyzed along with clinical and biomarker data up to 84 months following discharge. RESULT(S): Among 171 AKI and 175 non-AKI participants, IL-17A levels were elevated in AKI vs. non-AKI patients at 0M, 3M and 12M timepoints (pRESULT(S): Among 171 AKI and 175 non-AKI participants, IL-17A levels were elevated in AKI vs. non-AKI patients at 0M, 3M and 12M timepoints (pRESULT(S): Among 171 AKI and 175 non-AKI participants, IL-17A levels were elevated in AKI vs. non-AKI patients at 0M, 3M and 12M timepoints (pRESULT(S): Among 171 AKI and 175 non-AKI participants, IL-17A levels were elevated in AKI vs. non-AKI patients at 0M, 3M and 12M timepoints (pCONCLUSION(S): IL-17A was higher in patients with AKI vs. without AKI during hospitalization and up to 1-year post-discharge. IL-17A was higher in patients with progression of kidney disease after hospitalization but not independently associated with subsequent progression of kidney disease in fully adjusted models.

---

4. **Factors Associated with the Onset of Acute Kidney Injury Following Subarachnoid Hemorrhage.**

Authors: Fukuda, M.;Hirayu, N.;Nabeta, M.;Kikuchi, J.;Morioka, M.;Fukami, K. and Takasu, O.

Publication Date: 2024

Journal: World Neurosurgery (pagination), pp. Date of Publication: 2024

Abstract: Background: Acute kidney injury (AKI) is a complication often observed in critically ill patients, indicating a worsening prognosis. However, factors predicting AKI in subarachnoid hemorrhage (SAH) patients are unclear. This study aims to elucidate the predictors of AKI occurrence. Method(s): All patients with SAH admitted to the intensive care unit between 2013 and 2019 were included. Patients with very severe SAH who are unsuitable to receive aggressive treatment, those who previously received a contrast medium at another medical institution within 24 hours before admission, and those on maintenance dialysis were excluded. We retrospectively examined blood tests conducted upon admission, oral medications administered, and the total amount of contrast medium used after initiating treatment to investigate their association with AKI occurrence. Result(s): Of the 254 SAH patients treated during the relevant period, 195 (median age 64 years, 72 males) met the inclusion/exclusion criteria, and 32 patients (16.3%) developed AKI. When multivariate analysis was performed using sex, uric acid level, and hemoglobin, which obtained P Result(s): Of the 254 SAH patients treated during the relevant period, 195 (median age 64 years, 72 males) met the inclusion/exclusion criteria, and 32 patients (16.3%) developed AKI. When multivariate analysis was performed using sex, uric acid level, and hemoglobin, which obtained P Conclusion(s): AKI occurred in 16.3% of the patients with SAH. Patients who developed AKI had significantly higher uric acid levels. SAH with high uric acid levels warrants attention for AKI.

---

5. **New drugs for acute kidney injury.**

Authors: Hariri, G. and Legrand, M.

Publication Date: 2024

Journal: Journal of Intensive Medicine (pagination), pp. Date of Publication: 2024

Abstract: Acute kidney injury (AKI) presents a significant challenge in the management of critically ill patients, as it is associated with increased mortality, prolonged hospital stays, and increased healthcare costs. In certain conditions, such as during sepsis or after cardiac surgery, AKI is one of the most frequent complications, affecting 30 %-50 % of patients. Over time, even after the resolution of AKI, it can evolve into chronic kidney disease, a leading global cause of mortality, and cardiovascular complications. Despite significant improvement in the care of critically ill patients over the past two decades, the incidence of AKI remains stable, and novel approaches aiming at reducing its occurrence or improving AKI outcomes are still mostly lacking. However, recent insights into the pathophysiology of AKI within critical care settings have shed light on new pathways for both prevention and treatment, providing various new therapeutic targets aimed to mitigating kidney injury. These advancements highlight the intricate and multifaceted nature of the mechanisms underlying AKI, which could explain the challenge of identifying an effective treatment. Among these targets, modulation of the inflammatory responses and the cellular metabolism, hemodynamic regulation and enhancement of cellular repair mechanisms, have emerged as promising options. These multifaceted approaches offer renewed hope for limiting the incidence and severity of AKI in critically ill patients. Several ongoing clinical trials are evaluating the efficacy of these different strategies and we are facing an exiting time with multiple therapeutic interventions being tested to prevent or treat AKI. In this review, we aim to provide a summary of the new drugs evaluated for preventing or treating AKI in critical care and surgical settings.

---

6. **A pilot study on the differential urine proteomic profile of subjects with community-acquired acute kidney injury who recover versus those who do not recover completely at 4 months after hospital discharge.**

Authors: Kaur, Harpreet;Kamboj, Kajal;Naik, Sachin;Kumar, Vivek and Yadav, Ashok Kumar

Publication Date: Aug 19 ,2024

Journal: Frontiers in Medicine 11, pp. 1412561

Abstract: Background: Community-acquired acute kidney injury (CA-AKI) is a sudden structural damage and loss of kidney function in otherwise healthy individuals outside of hospital settings having high morbidity and mortality rates worldwide. Long-term sequelae of AKI involve an associated risk of progression to chronic kidney disease (CKD). Serum creatinine (SCr), the currently used clinical parameter for diagnosing AKI, varies greatly with age, gender, diet, and muscle mass. In the present study, we investigated the difference in urinary proteomic profile of subjects that recovered (R) and incompletely recovered (IR) from CA-AKI, 4 months after hospital discharge. Methods: Study subjects were recruited from ongoing study of CA-AKI cohort. Patients with either sex or age > 18 years with no underline CKD were enrolled at the time of hospital discharge. Incomplete recovery from CA-AKI was defined as eGFR : Study subjects were recruited from ongoing study of CA-AKI cohort. Patients with either sex or age > 18 years with no underline CKD were enrolled at the time of hospital discharge. Incomplete recovery from CA-AKI was defined as eGFR Results: A total of 28 subjects (14 in each group) were enrolled. Collectively, 2019 peptides and proteins with 30 high-abundance proteins in the incompletely recovered group (R/IR : A total of 28 subjects (14 in each group) were enrolled. Collectively, 2019 peptides and proteins with 30 high-abundance proteins in the incompletely recovered group (R/IR p-value 2.0, abundance ratio adj. p-value -value Conclusion: In conclusion, this study helped in identifying potential proteins and associated pathways that are either upregulated or downregulated at the time of hospital discharge in incompletely recovered CA-AKI patients that can be further investigated to check for their exact role in the disease progression or repair.

---

7. **Acute kidney injury: a post-COVID-19 complication in children and adolescents.**

Authors: Maranhao, Maria Clara Mendes;Mateus, Marina do Nascimento;Tosatto, Giovanna Sturzenegger;Pangracio, Erika;Schreiner, Giovanna Zatelli;Olandoski, Karen Previdi and Nisihara, Renato

Publication Date: 2024

Journal: Revista Paulista De Pediatria 43, pp. e2023171

Abstract: OBJECTIVE: To describe cases of acute kidney injury (AKI) in children diagnosed with COVID-19, associated risk factors, clinical aspects and outcome of cases. METHODS: Retrospective study, carried out in a pediatric hospital between March 2020 and September 2021, with patients with COVID-19 who were diagnosed with AKI, studying information present in medical records such as comorbidities, age, gender and use of nephrotoxic medications. RESULTS: We studied 40 cases, and male individuals were significantly more affected (62.5%; p=0.025). AKI was a severe complication of COVID-19 infection, with 100% of the sample requiring admission to the Intensive Care Unit and 22.5% dying. The most prevalent comorbidities analyzed in this study were epilepsy, cerebral palsy and heart disease. Most patients were classified according to Kidney Disease: Improving Global Outcomes (KDIGO) criteria as KDIGO 1 (42.5%), and required orotracheal intubation (67.5%). The frequency of use of nephrotoxic medications and need for dialysis was low, with percentages of 35 and 17.5%, respectively. Among the children who died, 70.4% had some comorbidity and 88.8% received invasive ventilation. CONCLUSIONS: AKI in children with COVID-19 infection is associated with severe conditions. Despite the severity, most patients were discharged alive from the hospital.

---

8. **Long-term outcomes after AKI in hospitalized patients with COVID-19.**

Authors: Marques da Silva, B.;Gameiro, J.;Lei Teixeira, J.;Costa, C.;Branco, C.;Oliveira, J.;Bernardo, J.;Marques, F.;Agapito Fonseca, J. and Lopes, J. A.

Publication Date: 2024

Journal: Nefrologia (pagination), pp. Date of Publication: 2024

Abstract: Introduction and objectives: Acute kidney injury (AKI) is frequent in hospitalized patients and contributes to adverse short- and long-term outcomes. We aimed to evaluate the association of AKI and long-term adverse renal events and mortality in a cohort of patients hospitalized with COVID-19. Material(s) and Method(s): Single-center and retrospective study of hospitalized patients admitted to a Dedicated Unit for COVID-19 at Centro Hospitalar Universitario Lisboa Norte, Portugal, between March 2020 and October 2020. AKI was defined and classified according to the Kidney Disease: Improving Global Outcomes (KDIGO) classification, using SCr criteria. The analyzed outcomes were development of major adverse kidney events (MAKE), major adverse renal cardiovascular events (MARCE), and mortality over a two-year follow-up period. Result(s): From the included 409 patients, AKI occurred in 60.4% (n = 247). Within two years after discharge, 31.8% (n = 130) of patients had an eGFR Result(s): From the included 409 patients, AKI occurred in 60.4% (n = 247). Within two years after discharge, 31.8% (n = 130) of patients had an eGFR 2 and/or a 25% decrease on eGFR and 1.7% (n = 7) of patients required RRT, 6.1% (n = 25) of patients had CV events and 27.9% (n = 114) of patients died. The incidence of MAKE was 60.9% (n = 249), and MARCE was 62.6% (n = 256). On a multivariate analysis, older age (adjusted HR 1.02 (95% CI: 1.01-1.04), p = 0.008), cardiovascular disease (adjusted HR 2.22 (95% CI: 1.24-3.95), p = 0.007), chronic kidney disease (adjusted HR 5.15 (95% CI: 2.22-11.93), p and/or a 25% decrease on eGFR and 1.7% (n = 7) of patients required RRT, 6.1% (n = 25) of patients had CV events and 27.9% (n = 114) of patients died. The incidence of MAKE was 60.9% (n = 249), and MARCE was 62.6% (n = 256). On a multivariate analysis, older age (adjusted HR 1.02 (95% CI: 1.01-1.04), p = 0.008), cardiovascular disease (adjusted HR 2.22 (95% CI: 1.24-3.95), p = 0.007), chronic kidney disease (adjusted HR 5.15 (95% CI: 2.22-11.93), p and/or a 25% decrease on eGFR and 1.7% (n = 7) of patients required RRT, 6.1% (n = 25) of patients had CV events and 27.9% (n = 114) of patients died. The incidence of MAKE was 60.9% (n = 249), and MARCE was 62.6% (n = 256). On a multivariate analysis, older age (adjusted HR 1.02 (95% CI: 1.01-1.04), p = 0.008), cardiovascular disease (adjusted HR 2.22 (95% CI: 1.24-3.95), p = 0.007), chronic kidney disease (adjusted HR 5.15 (95% CI: 2.22-11.93), p and/or a 25% decrease on eGFR and 1.7% (n = 7) of patients required RRT, 6.1% (n = 25) of patients had CV events and 27.9% (n = 114) of patients died. The incidence of MAKE was 60.9% (n = 249), and MARCE was 62.6% (n = 256). On a multivariate analysis, older age (adjusted HR 1.02 (95% CI: 1.01-1.04), p = 0.008), cardiovascular disease (adjusted HR 2.22 (95% CI: 1.24-3.95), p = 0.007), chronic kidney disease (adjusted HR 5.15 (95% CI: 2.22-11.93), p Conclusion(s): In this cohort of hospitalized patients with COVID-19, AKI was independently associated with the risk of long-term need for dialysis and/or renal function decline and/or mortality after hospital discharge.

---

9. **Low incidence of acute kidney injury with combined intravenous and topical antibiotic infusions in periprosthetic joint infection after total knee arthroplasty.**

Authors: Mu, Wenbo;Xu, Boyong;Wang, Fei;Maimaitiaimaier, Yilixiati;Zou, Chen and Cao, Li

Publication Date: Oct 01 ,2024

Journal: Bone & Joint Research 13(10), pp. 525–534

Abstract: Aims: This study aimed to assess the risk of acute kidney injury (AKI) associated with combined intravenous (IV) and topical antibiotic therapy in patients undergoing treatment for periprosthetic joint infections (PJIs) following total knee arthroplasty (TKA), utilizing the Kidney Disease: Improving Global Outcomes (KDIGO) criteria for classification. Methods: We conducted a retrospective analysis of 162 knees (162 patients) that received treatment for PJI post-TKA with combined IV and topical antibiotic infusions at a single academic hospital from 1 January 2010 to 31 December 2022. The incidence of AKI was evaluated using the KDIGO criteria, focussing on the identification of significant predictors and the temporal pattern of AKI development. Results: AKI was identified in 9.26% (15/162) of the cohort, predominantly presenting as stage 1 AKI, which was transient in nature and resolved prior to discharge. The analysis highlighted moderate anaemia and

lower baseline serum creatinine levels as significant predictors for the development of AKI. Notably, the study found no instances of severe complications such as wound dehiscence, skin erosion, or the need for haemodialysis following treatment. Conclusion: The findings suggest that the combined use of IV and topical antibiotic therapy in the management of PJIs post-TKA is associated with a low incidence of primarily transient stage 1 AKI. This indicates a potentially favourable renal safety profile, advocating for further research to confirm these outcomes and potentially influence treatment protocols in PJI management. Copyright © 2024 Mu et al.

---

10. **Rhabdomyolysis-related acute kidney injury in patients with COVID-19.**

Authors: Murt, Ahmet and Altiparmak, Mehmet Riza

Publication Date: Sep 25 ,2024

Journal: World Journal of Virology 13(3), pp. 91107

Abstract: BACKGROUND: Viral and bacterial infections may be complicated by rhabdomyolysis, which has a spectrum of clinical presentations ranging from asymptomatic laboratory abnormalities to life-threatening conditions such as renal failure. Direct viral injury as well as inflammatory responses may cause rhabdomyolysis in the course of coronavirus disease 2019 (COVID-19). When presented with acute kidney injury (AKI), rhabdomyolysis may be related to higher morbidity and mortality. AIM: To compare rhabdomyolysis-related AKI with other AKIs during COVID-19. METHODS: A total of 115 patients with COVID-19 who had AKI were evaluated retrospectively. Fifteen patients had a definite diagnosis of rhabdomyolysis (i.e., creatine kinase levels increased to > 5 times the upper normal range with a concomitant increase in transaminases and lactate dehydrogenase). These patients were aged 61.0 +/- 19.1 years and their baseline creatinine levels were 0.87 +/- 0.13 mg/dL. Patients were treated according to national COVID-19 treatment guidelines. They were compared with patients with COVID-19 who had AKI due to other reasons. RESULTS: For patients with rhabdomyolysis, creatinine reached 2.47 +/- 1.17 mg/dL during follow-up in hospital. Of these patients, 13.3% had AKI upon hospital admission, and 86.4% developed AKI during hospital follow-up. Their peak C-reactive protein reached as high as 253.2 +/- 80.6 mg/L and was higher than in patients with AKI due to other reasons (P P = 0.02 and P = 0.002, respectively). The mortality of patients with rhabdomyolysis was calculated as 73.3%, which was higher than in other patients with AKI (18.1%) (P = 0.001). CONCLUSION: Rhabdomyolysis was present in 13.0% of the patients who had AKI during COVID-19 infection. Rhabdomyolysis-related AKI is more proinflammatory and has a more mortal clinical course.

---

11. **Erythropoiesis-stimulating agents for preventing acute kidney injury**

Authors: Nishiwaki, Hiroki;Abe, Yoshifusa;Suzuki, Taihei;Hasegawa, Takeshi;Levack, William Mm;Noma, Hisashi and Ota, Erika

Publication Date: 09 20 ,2024

Journal: Cochrane Database of Systematic Reviews 9, pp. CD014820

Abstract: BACKGROUND: Acute kidney injury (AKI) is characterised by a rapid decline in kidney function and is caused by a variety of clinical conditions. The incidence of AKI in hospitalised adults is high. In animal studies, erythropoiesis-stimulating agents (ESA) have been shown to act as a novel nephroprotective agent against ischaemic, toxic, and septic AKI by inhibiting apoptosis, promoting cell proliferation, and inducing antioxidant and anti-inflammatory responses. As a result, ESAs may reduce the incidence of AKI in humans. Randomised controlled trials (RCTs) have been conducted on the efficacy and safety of ESAs, but no prior systematic reviews exist that comprehensively examine ESAs with respect to AKI prevention, although the effectiveness of these agents has been examined for a range of other diseases and clinical situations. OBJECTIVES: This review aimed to look at the benefits

and harms of ESAs for preventing AKI in the context of any health condition. SEARCH METHODS: We searched the Cochrane Kidney and Transplant Register of Studies up to 30 August 2024 through contact with the Information Specialist using search terms relevant to this review. Studies in the Register are identified through searches of CENTRAL, MEDLINE, and EMBASE, conference proceedings, the International Clinical Trials Registry Platform (ICTRP) Search Portal and ClinicalTrials.gov. SELECTION CRITERIA: We included RCTs and quasi-RCTs (in which allocation to treatment was based on alternate assignment or order of medical records, admission dates, date of birth or other non-random methods) that compared ESAs with placebo or standard care in people at risk of AKI. DATA COLLECTION AND ANALYSIS: Three authors independently extracted data and assessed the risk of bias for included studies. We used random-effects model meta-analyses to perform quantitative synthesis of the data. We used the I2 statistic to measure heterogeneity amongst the studies in each analysis. We indicated summary estimates as a risk ratio (RR) for dichotomous outcomes and mean difference (MD) for continuous outcomes with their 95% confidence interval (CI). We assessed the certainty of the evidence for each main outcome using the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) approach. MAIN RESULTS: A total of 20 studies (36 records, 5348 participants) were included. The number of participants ranged from 10 to 1302, and most studies were carried out in single centres (13/20). All the included studies compared ESAs to placebo or usual care. Many of the studies were judged to have unclear or high risk of reporting bias, but were at low risk for other types of bias. ESAs, when compared to control interventions, probably makes little or no difference to the risk of AKI (18 studies, 5314 participants: RR 0.97, 95% CI 0.85 to 1.10; I2 = 19%; moderate-certainty evidence), or death (18 studies, 5263 participants: RR 0.92, 95% CI 0.80 to 1.06; I2 = 0%; moderate-certainty evidence), and may make little or no difference to the initiation of dialysis (14 studies, 2059 participants: RR 1.16, 95% CI 0.90 to 1.51; I2 = 0%; low-certainty evidence). Even with standardised measurement of AKI, the studies showed no difference in results between different routes of administration (subcutaneous or intravenous), background diseases (cardiac surgeries, children or neonates, other adults at risk of AKI), or duration or dose of ESA. ESAs may make little or no difference to the risk of thrombosis when compared to control interventions (8 studies, 3484 participants: RR 0.92, 95% CI 0.68 to 1.24; I2 = 0%). Similarly, ESAs may have little or no effect on kidney function measures and adverse events such as myocardial infarction, stroke or hypertension. However, this may be due to the low incidence of these adverse events. AUTHORS' CONCLUSIONS: In patients at risk of AKI, ESAs probably do not reduce the risk of AKI or death and may not reduce the need for starting dialysis. Similarly, there may be no differences in kidney function measures and adverse events such as thrombosis, myocardial infarction, stroke or hypertension. There are currently two ongoing studies that have either not been completed or published, and it is unclear whether they will change the results. Caution should be exercised when using ESAs to prevent AKI.

---

12. **Identification of factors associated with vancomycin-induced acute kidney injury: A retrospective analysis using the Common Data Model.**

Authors: Park, S. I.;Kim, J. K.;Yu, U. and Park, J. I.

Publication Date: 2024

Journal: International Journal of Clinical Pharmacology and Therapeutics (pagination), pp. Date of Publication: 24 Se 2024

Abstract: OBJECTIVE: Previous findings on predictors of vancomycin-induced acute kidney injury (AKI) are inconsistent. We aimed to identify the predictors of vancomycin-induced AKI using the Observational Medical Outcome Partnership Common Data Model. MATERIALS AND METHODS: We analyzed data from patients treated with vancomycin between January 1, 2012, and May 31, 2022, who were positive for Staphylococcus aureus and had undergone oxacillin susceptibility tests. After excluding patients without data for vancomycin or baseline serum creatinine levels, 116 patients were included in the final dataset. Data up to the third measured vancomycin concentration were collected for each patient. Logistic regression models were used to estimate the odds ratio and 95% confidence

interval for each variable associated with vancomycin-induced AKI. RESULT(S): High baseline serum creatinine levels, intensive care unit admission, and concurrent renal disorders were significantly associated with vancomycin-induced AKI. Although high trough levels or area under the curve values were not significantly associated with vancomycin-induced AKI, both were significantly higher in patients with AKI than in those without AKI at the second vancomycin concentration measurement. The proportion with trough levels > 20 mg/L was higher in patients with AKI than in those without AKI at the third measurement. CONCLUSION(S): Our findings revealed that underlying renal disease and intensive care unit admission are more significantly associated with vancomycin-induced AKI than vancomycin pharmacokinetic parameters or dosage, likely due to vancomycin concentration-based dosage adjustment in clinical settings. Our findings may help develop strategies for reducing the incidence of vancomycin-induced AKI; however, further prospective studies are essential.

---

13. **Acute Kidney Injury in Rhabdomyolysis: A 5-Year Children's Hospital Network Study.**

Authors: Pinto, Jamie M.;Ison, Gregory;Kasselman, Lora J. and Naganathan, Srividya

Publication Date: Aug 28 ,2024

Journal: Healthcare 12(17)

Abstract: Rhabdomyolysis is a skeletal muscle injury that can cause myoglobinuria and acute kidney injury (AKI). Risk factors for AKI in children are not clearly understood with no standardized treatment guidelines for rhabdomyolysis. Our study explores factors associated with AKI and management of pediatric patients with rhabdomyolysis. Medical records from a children's hospital network over a 5-year period were retrospectively reviewed. The results are described with respect to the presence or absence of AKI. Of the 112 patients who met the inclusion criteria, AKI incidence was 7.1% (n = 8), with all affected patients having exertional etiology. The overall mean age was 13.5 years; patients without AKI were younger than patients with AKI (13.3 versus 17; p p = 0.03), have myoglobinuria (OR = 22.98, 95%CI [2.05-432.48]; p = 0.02), and have received intravenous bicarbonate (OR = 16.02, 95%CI [1.44-228.69]; p = 0.03). In our study, AKI was uncommon and associated with older age, myoglobinuria and bicarbonate treatment. Larger, prospective studies are needed to further understand AKI risk factors and optimal management of pediatric rhabdomyolysis.

---

14. **Acute kidney injury in the acute care surgery patient: What you need to know.**

Authors: Villegas, C. V.;Gorman, E.;Liu, F. M. and Winchell, R. J.

Publication Date: 2024

Journal: Journal of Trauma and Acute Care Surgery (pagination)

Abstract: Acute kidney injury is associated with poor outcomes in the trauma and emergency general surgery population, and recent consensus definitions have allowed for significant advances in defining the burden of disease. The current definitions rely on overall functional measures (i.e., serum creatinine and urine output), which can be confounded by a variety of clinical factors. Biomarkers are increasingly being investigated as more direct diagnostic assays for the diagnosis of acute kidney injury and may allow earlier detection and more timely therapeutic intervention. Etiologies fall into two general categories: disorders of renal perfusion and exposure to nephrotoxic agents. Therapy is largely supportive, and prevention offers the best chance to decrease clinical impact.

---

15. **Artificial intelligence algorithms permits rapid acute kidney injury risk classification of patients with acute myocardial infarction.**

Authors: Wei, Jun;Cai, Dabei;Xiao, Tingting;Chen, Qianwen;Zhu, Wenwu;Gu, Qingqing;Wang, Yu;Wang,

Qingjie;Chen, Xin;Ge, Shenglin and Sun, Ling

Publication Date: Aug 30 ,2024

Journal: Heliyon 10(16), pp. e36051

Abstract: Objective: This study aimed to develop and validate several artificial intelligence (AI) models to identify acute myocardial infarction (AMI) patients at an increased risk of acute kidney injury (AKI) during hospitalization. Methods: Included were patients diagnosed with AMI from the Medical Information Mart for Intensive Care (MIMIC) III and IV databases. Two cohorts of AMI patients from Changzhou Second People's Hospital and Xuzhou Center Hospital were used for external validation of the models. Patients' demographics, vital signs, clinical characteristics, laboratory results, and therapeutic measures were extracted. Totally, 12 AI models were developed. The area under the receiver operating characteristic curve (AUC) were calculated and compared. Results: AKI occurred during hospitalization in 1098 (28.3 %) of the 3882 final enrolled patients, split into training (3105) and test (777) sets randomly. Among them, Random Forest (RF), C5.0 and Bagged CART models outperformed the other models in both the training and test sets. The AUCs for the test set were 0.754, 0.734 and 0.730, respectively. The incidence of AKI was 9.8 % and 9.5 % in 2202 patients in the Changzhou cohort and 807 patients in the Xuzhou cohort with AMI, respectively. The AUCs for patients in the Changzhou cohort were RF, 0.761; C5.0, 0.733; and bagged CART, 0.725, respectively, and Xuzhou cohort were RF, 0.799; C5.0, 0.808; and bagged CART, 0.784, respectively. Conclusion: Several machines learning-based prediction models for AKI after AMI were developed and validated. The RF, C5.0 and Bagged CART model performed robustly in identifying high-risk patients earlier. Clinical trial approval statement: This Trial was registered in the Chinese clinical trials registry: ChiCTR1800014583. Registered January 22, 2018 (http://www.chictr.org.cn/searchproj.aspx).

---

16. **Nomogram Model to Predict Acute Kidney Injury in Hospitalized Patients with Heart Failure.**

Authors: Xu, Ruochen;Chen, Kangyu;Wang, Qi;Liu, Fuyuan;Su, Hao and Yan, Ji

Publication Date: Aug ,2024

Journal: Reviews in Cardiovascular Medicine 25(8), pp. 293

Abstract: Background: Acute kidney injury (AKI) is a common complication of acute heart failure (HF) that can prolong hospitalization time and worsen the prognosis. The objectives of this research were to ascertain independent risk factors of AKI in hospitalized HF patients and validate a nomogram risk prediction model established using those factors. Methods: Finally, 967 patients hospitalized for HF were included. Patients were randomly assigned to the training set (n = 677) or test set (n = 290). Least absolute shrinkage and selection operator (LASSO) regression was performed for variable selection, and multivariate logistic regression analysis was used to search for independent predictors of AKI in hospitalized HF patients. A nomogram prediction model was then developed based on the final identified predictors. The performance of the nomogram was assessed in terms of discriminability, as determined by the area under the receiver operating characteristic (ROC) curve (AUC), and predictive accuracy, as determined by calibration plots. Results: The incidence of AKI in our cohort was 19%. After initial LASSO variable selection, multivariate logistic regression revealed that age, pneumonia, D-dimer, and albumin were independently associated with AKI in hospitalized HF patients. The nomogram prediction model based on these independent predictors had AUCs of 0.760 and 0.744 in the training and test sets, respectively. The calibration plots indicate a strong concordance between the estimated AKI probabilities and the observed probabilities. Conclusions: A nomogram prediction model based on pneumonia, age, D-dimer, and albumin can help clinicians predict the risk of AKI in HF patients with moderate discriminability.

---

17. **EXPRESS: Association between acetaminophen and risk of mortality in patients with sepsis-**

associated acute kidney injury: A retrospective cohort study from the MIMIC-IV database.

Authors: Yu, H.;Yang, T. and Liu, D.

Publication Date: 2024

Journal: Journal of Investigative Medicine : The Official Publication of the American Federation for Clinical Research , pp. 10815589241290210

Abstract: The occurrence of sepsis-associated acute kidney injury (SA-AKI) predicts a worse prognosis. We aimed to assess the impact of acetaminophen use on short-term mortality in patients with SA-AKI. A total of 6,563 patients diagnosed with SA-AKI from the 2008-2019 Medical Information Mart for Intensive Care IV (MIMIC-IV) database were enrolled in this retrospective cohort study. The Cox regression model was utilized to analyze the associations of acetaminophen with 30-day mortality and in-hospital mortality. Additional propensity score matching (PSM) analysis was performed regarding patients with acetaminophen use versus those without. Of these patients, 30-day mortality occurred in 1,421 (21.65%) patients and in-hospital mortality in 1,246 (18.99%) patients. Patients who used acetaminophen were associated with a reduced risk of 30-day mortality [hazard ratio (HR)=0.80, 95% confidence interval (CI): 0.71-0.90] and in-hospital mortality (HR=0.72, 95%CI: 0.63-0.82). The PSM analysis demonstrated that acetaminophen use was still related to a reduced risk of 30-day mortality and in-hospital mortality. Subgroup analysis showed that the relationships between acetaminophen and 30-day mortality and in-hospital mortality were consistent across subgroups (P<0.05). The use of acetaminophen has an association with lower short-term mortality in patients with SA-AKI.

---

18. **Construction and validation of a risk nomogram for sepsis-associated acute kidney injury in intensive care unit.**

Authors: Zhang, J.;Qi, M.;Ma, L.;Zhang, K. and Liu, D.

Publication Date: 2024

Journal: Zhonghua Wei Zhong Bing Ji Jiu Yi Xue 36(8), pp. 801–807

Abstract: OBJECTIVE: To construct and validate a nomogram model for predicting sepsis-associated acute kidney injury (SA-AKI) risk in intensive care unit (ICU) patients. METHOD(S): A retrospective cohort study was conducted. Adult sepsis patients admitted to the department of ICU of the 940th Hospital of Joint Logistic Support Force of PLA from January 2017 to December 2022 were enrolled. Demographic characteristics, clinical data within 24 hours after admission to ICU diagnosis, and clinical outcomes were collected. Patients were divided into training set and validation set according to a 7 : 3 ratio. According to the consensus report of the 28th Acute Disease Quality Initiative Working Group (ADQI 28), the data were analyzed with serum creatinine as the parameter and AKI occurrence 7 days after sepsis diagnosis as the outcome. Lasso regression analysis and univariate and multivariate Logistic regression analysis were performed to construct the nomogram prediction model for SA-AKI. The discrimination and accuracy of the model were evaluated by the Hosmer-Lemeshow test, receiver operator characteristic curve (ROC curve), decision curve analysis (DCA), and clinical impact curve (CIC). RESULT(S): A total of 247 sepsis patients were enrolled, 184 patients developed SA-AKI (74.49%). The number of AKI patients in the training and validation sets were 130 (75.58%) and 54 (72.00%), respectively. After Lasso regression analysis and univariate and multivariate Logistic regression analysis, four independent predictive factors related to the occurrence of SA-AKI were selected, namely procalcitonin (PCT), prothrombin activity (PTA), platelet distribution width (PDW), and uric acid (UA) were significantly associated with the onset of SA-AKI, the odds ratio (OR) and 95% confidence interval (95%CI) was 1.03 (1.01-1.05), 0.97 (0.55-0.99), 2.68 (1.21-5.96), 1.01 (1.00-1.01), all P RESULT(S): A total of 247 sepsis patients were enrolled, 184 patients developed SA-AKI (74.49%). The number of AKI patients in the training and validation sets were 130 (75.58%) and 54 (72.00%), respectively. After Lasso regression analysis and univariate and multivariate Logistic regression

analysis, four independent predictive factors related to the occurrence of SA-AKI were selected, namely procalcitonin (PCT), prothrombin activity (PTA), platelet distribution width (PDW), and uric acid (UA) were significantly associated with the onset of SA-AKI, the odds ratio (OR) and 95% confidence interval (95%CI) was 1.03 (1.01-1.05), 0.97 (0.55-0.99), 2.68 (1.21-5.96), 1.01 (1.00-1.01), all P CONCLUSION(S): A nomogram model based on clinical indicators of sepsis patients admitted to the ICU within 24 hours could be used to predict the risk of SA-AKI, which would be beneficial for early identification and treatment on SA-AKI.

---

19. **The relationship between Geriatric Nutritional Risk Index (GNRI) and in-hospital mortality in critically ill patients with Acute Kidney Injury (AKI).**

Authors: Zhao, Dong;Zhou, Dawei;Li, Tong;Wang, Chao and Fei, Shuyang

Publication Date: Sep 06 ,2024

Journal: BMC Anesthesiology 24(1), pp. 313

Abstract: BACKGROUND: The role of the geriatric nutritional risk index (GNRI) as a prognostic factor in intensive care unit (ICU) patients with acute kidney injury (AKI) remains uncertain. OBJECTIVES: The aim of this study was to investigate the impact of the GNRI on mortality outcomes in critically ill patients with AKI. METHODS: For this retrospective study, we included 12,058 patients who were diagnosed with AKI based on ICD-9 codes from the eICU Collaborative Research Database. Based on the values of GNRI, nutrition-related risks were categorized into four groups: major risk (GNRI : For this retrospective study, we included 12,058 patients who were diagnosed with AKI based on ICD-9 codes from the eICU Collaborative Research Database. Based on the values of GNRI, nutrition-related risks were categorized into four groups: major risk (GNRI : For this retrospective study, we included 12,058 patients who were diagnosed with AKI based on ICD-9 codes from the eICU Collaborative Research Database. Based on the values of GNRI, nutrition-related risks were categorized into four groups: major risk (GNRI : For this retrospective study, we included 12,058 patients who were diagnosed with AKI based on ICD-9 codes from the eICU Collaborative Research Database. Based on the values of GNRI, nutrition-related risks were categorized into four groups: major risk (GNRI : For this retrospective study, we included 12,058 patients who were diagnosed with AKI based on ICD-9 codes from the eICU Collaborative Research Database. Based on the values of GNRI, nutrition-related risks were categorized into four groups: major risk (GNRI = 98). Multivariate analysis was used to evaluate the relationship between GNRI and outcomes. RESULTS: Patients with higher nutrition-related risk tended to be older, female, had lower blood pressure, lower body mass index, and more comorbidities. Multivariate analysis showed GNRI scores were associated with in-hospital mortality. (Major risk vs. No risk: OR, 95% CI: 1.90, 1.54-2.33, P : Patients with higher nutrition-related risk tended to be older, female, had lower blood pressure, lower body mass index, and more comorbidities. Multivariate analysis showed GNRI scores were associated with in-hospital mortality. (Major risk vs. No risk: OR, 95% CI: 1.90, 1.54-2.33, P : Patients with higher nutrition-related risk tended to be older, female, had lower blood pressure, lower body mass index, and more comorbidities. Multivariate analysis showed GNRI scores were associated with in-hospital mortality. (Major risk vs. No risk: OR, 95% CI: 1.90, 1.54-2.33, P : Patients with higher nutrition-related risk tended to be older, female, had lower blood pressure, lower body mass index, and more comorbidities. Multivariate analysis showed GNRI scores were associated with in-hospital mortality. (Major risk vs. No risk: OR, 95% CI: 1.90, 1.54-2.33, P : Patients with higher nutrition-related risk tended to be older, female, had lower blood pressure, lower body mass index, and more comorbidities. Multivariate analysis showed GNRI scores were associated with in-hospital mortality. (Major risk vs. No risk: OR, 95% CI: 1.90, 1.54-2.33, P CONCLUSIONS: GNRI serves as a significant nutrition assessment tool that is pivotal to predicting the prognosis of critically ill patients with AKI.

---

20. **Niacinamide May Be Associated with Improved Outcomes in COVID-19-Related Acute Kidney Injury: An Observational Study.**

Authors: Raines, N. H.;Ganatra, S.;Nissaisorakarn, P.;Pandit, A.;Morales, A.;Asnani, A.;Sadrolashrafi, M.;Maheshwari, R.;Patel, R.;Bang, V.;Shreyder, K.;Brar, S.;Singh, A.;Dani, S. S.;Knapp, S.;Poyan Mehr, A.;Brown, R. S.;Zeidel, M. L.;Bhargava, R.;Schlondorff, J., et al

Publication Date: 2021

Journal: Kidney360 2(1), pp. 33–41

Abstract: Background: AKI is a significant complication of coronavirus disease 2019 (COVID-19), with no effective therapy. Niacinamide, a vitamin B3 analogue, has some evidence of efficacy in non-COVID-19-related AKI. The objective of this study is to evaluate the association between niacinamide therapy and outcomes in patients with COVID-19-related AKI. Method(s): We implemented a quasi-experimental design with nonrandom, prospective allocation of niacinamide in 201 hospitalized adult patients, excluding those with baseline eGFR Method(s): We implemented a quasi-experimental design with nonrandom, prospective allocation of niacinamide in 201 hospitalized adult patients, excluding those with baseline eGFR Result(s): A total of 38 out of 90 B3 patients and 62 out of 111 non-B3 patients died or received RRT. Using multivariable Cox proportional hazard modeling, niacinamide was associated with a lower risk of RRT or death (HR, 0.64; 95% CI, 0.40 to 1.00; P=0.05), an association driven by patients with KDIGO stage-2/3 AKI (HR, 0.29; 95% CI, 0.13 to 0.65; P=0.03; P interaction with KDIGO stage=0.03). Total mortality also followed this pattern (HR, 0.17; 95% CI, 0.05 to 0.52; in patients with KDIGO stage-2/3 AKI, P=0.002). Serum creatinine after AKI increased by 0.20 (SEM, 0.08) mg/dl per day among non-B3 patients with KDIGO stage-2/3 AKI, but was stable among comparable B3 patients (+0.01 [SEM, 0.06] mg/dl per day; P interaction=0.03). Conclusion(s): Niacinamide was associated with lower risk of RRT/death and improved creatinine trajectory among patients with severe COVID-19-related AKI. Larger randomized studies are necessary to establish a causal relationship.

Sources Used: The following databases are used in the creation of this bulletin: EMBASE and Medline.