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Date of Search: 28 Apr 2017

Sources Searched: Medline, Embase, DynaMed Plus

Acute Kidney Injury and Risk of Transition to Chronic Kidney Disease

Summary

In the past patients surviving acute kidney injury (AKI) were assumed to have a good renal prognosis. This belief however was based on studies with varying definitions of renal function recovery or those which considered recovery to be independence from dialysis at hospital discharge. It has now been established that AKI, even when mild or followed by full recovery is associated with increased risk of chronic kidney disease (CKD).

Several risk factors for CKS development after AKI have been identified, including severity of AKI, age >65 years, proteinuria and diabetes mellitus. Although prediction models have been developed, to identify at risk patients, they are in need of validation and refinement. The identification of AKI survivors who are at high risk of developing CKD therefore represents an important opportunity to improve outcomes.

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1. Renal Recovery after Acute Kidney Injury.

Author(s): Macedo, Etienne; Mehta, Ravindra L

Source: Contributions to nephrology; 2016; vol. 187 ; p. 24-35

Publication Date: 2016

Publication Type(s): Journal Article Review

Abstract:Until recently, patients surviving an episode of acute kidney injury (AKI) were assumed to have a good renal prognosis. This belief was predominantly based on studies that used heterogeneous AKI definitions and that considered renal recovery as dialysis independence at hospital discharge. Since standardized definitions of AKI have become available, several studies have established an association between AKI and adverse clinical outcomes. It is now well recognized that while the glomerular filtration rate generally improves after AKI, the renal recovery process is often incomplete and can result in a chronic decrease in kidney function. The loss of kidney function can vary from subclinical decreases in the glomerular filtration rate to end-stage renal disease. In this chapter, we review our current understanding of renal recovery following AKI and discuss the main studies that have established associations between AKI and the development of chronic kidney disease and end-stage renal disease.

Database: Medline

2. Predicting progression to chronic kidney disease after recovery from acute kidney injury.

Author(s): Heung, Michael; Chawla, Lakhmir S

Source: Current opinion in nephrology and hypertension; Nov 2012; vol. 21 (no. 6); p. 628-634

Publication Date: Nov 2012

Publication Type(s): Journal Article Review

Available in full text at [Current Opinion in Nephrology and Hypertension](#) - from Ovid

Abstract:**PURPOSE OF REVIEW** This review examines the association between acute kidney injury (AKI) and subsequent risk for chronic kidney disease (CKD) development. The discussion focuses on patients who fully recover from an episode of AKI, the majority of whom do not receive follow-up care with nephrology services.**RECENT FINDINGS** Several studies have demonstrated a strong association between AKI and later CKD risk. Animal models provide evidence for a causal link between AKI and CKD while also elucidating some of the potential mechanisms for this progression. Large observational studies have quantified the risk of CKD following AKI recovery, and clinical and emerging biomarker risk factors have been identified.**SUMMARY**The association between AKI with incomplete recovery or nonrecovery and CKD is evident. Recent studies demonstrate that even AKI with apparent full recovery confers an increased risk for subsequent CKD development. Risk prediction models have been developed and require further refinement and validation. The ability to identify patients with AKI recovery who are at high risk for later CKD development is an important clinical and research goal, as there exists a significant opportunity to improve care in this population.

Database: Medline

3. Long-term prognosis after acute kidney injury (AKI): what is the role of baseline kidney function and recovery? A systematic review.

Author(s): Sawhney, Simon; Mitchell, Mhairi; Marks, Angharad; Fluck, Nick; Black, Corrinna

Source: BMJ open; Jan 2015; vol. 5 (no. 1); p. e006497

Publication Date: Jan 2015

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article Review

Available in full text at [BMJ Open](#) - from National Library of Medicine

Abstract:OBJECTIVE To summarise the evidence from studies of acute kidney injury (AKI) with regard to the effect of pre-AKI renal function and post-AKI renal function recovery on long-term mortality and renal outcomes, and to assess whether these factors should be taken into account in future prognostic studies. DESIGN/SETTING A systematic review of observational studies listed in Medline and EMBASE from 1990 to October 2012. PARTICIPANTS All AKI studies in adults with data on baseline kidney function to identify AKI; with outcomes either stratified by pre-AKI and/or post-AKI kidney function, or described by the timing of the outcomes. OUTCOMES Long-term mortality and worsening chronic kidney disease (CKD). RESULTS Of 7385 citations, few studies met inclusion criteria, reported baseline kidney function and stratified by pre-AKI or post-AKI function. For mortality outcomes, three studies compared patients by pre-AKI renal function and six by post-AKI function. For CKD outcomes, two studies compared patients by pre-AKI function and two by post-AKI function. The presence of CKD pre-AKI (compared with AKI alone) was associated with doubling of mortality and a fourfold to fivefold increase in CKD outcomes. Non-recovery of kidney function was associated with greater mortality and CKD outcomes in some studies, but findings were inconsistent varying with study design. Two studies also reported that risk of poor outcome reduced over time post-AKI. Meta-analysis was precluded by variations in definitions for AKI, CKD and recovery. CONCLUSIONS The long-term prognosis after AKI varies depending on cause and clinical setting, but it may also, in part, be explained by underlying pre-AKI and post-AKI renal function rather than the AKI episode itself. While carefully considered in clinical practice, few studies address these factors and with inconsistent study design. Future AKI studies should report pre-AKI and post-AKI function consistently as additional factors that may modify AKI prognosis.

Database: Medline

4. Chronic kidney disease after acute kidney injury: a systematic review and meta-analysis

Author(s): Coca S.G.; Parikh C.R.; Singanamala S.

Source: Kidney International; Nov 2011

Publication Date: Nov 2011

Publication Type(s): Article In Press

Available in full text at [Kidney International](#) - from ProQuest

Abstract: Acute kidney injury may increase the risk for chronic kidney disease and end-stage renal disease. In an attempt to summarize the literature and provide more compelling evidence, we conducted a systematic review comparing the risk for CKD, ESRD, and death in patients with and without AKI. From electronic databases, web search engines, and bibliographies, 13 cohort studies were selected, evaluating long-term renal outcomes and non-renal outcomes in patients with AKI. The pooled incidence of CKD and ESRD were 25.8 per 100 person-years and 8.6 per 100 person-years, respectively. Patients with AKI had higher risks for developing CKD (pooled adjusted hazard ratio 8.8, 95% CI 3.1-25.5), ESRD (pooled adjusted HR 3.1, 95% CI 1.9-5.0), and mortality (pooled

adjusted HR 2.0, 95% CI 1.3-3.1) compared with patients without AKI. The relationship between AKI and CKD or ESRD was graded on the basis of the severity of AKI, and the effect size was dampened by decreased baseline glomerular filtration rate. Data were limited, but AKI was also independently associated with the risk for cardiovascular disease and congestive heart failure, but not with hospitalization for stroke or all-cause hospitalizations. Meta-regression did not identify any study-level factors that were associated with the risk for CKD or ESRD. Our review identifies AKI as an independent risk factor for CKD, ESRD, death, and other important non-renal outcomes. *Kidney International* advance online publication, 23 November 2011; doi:10.1038/ki.2011.379.

Database: EMBASE

5. Long-term consequences of acute kidney injury in the perioperative setting

Author(s): Palant C.E.; Chawla L.S.; Amdur R.L.

Source: *Current Opinion in Anaesthesiology*; 2017; vol. 30 (no. 1); p. 100-104

Publication Date: 2017

Publication Type(s): Review

Available in full text at [Current Opinion in Anaesthesiology](#) - from Ovid

Abstract: Purpose of review Recent studies indicate that acute kidney injury (AKI) and chronic kidney disease (CKD) are interconnected syndromes. Although the majority of patients who suffer an episode of AKI will recover laboratory indices suggesting complete or near complete recovery of renal function, a significant portion of post-AKI survivors will develop major kidney events, including development of late-stage CKD, need for renal replacement therapies, and death. Recent findings Our review highlights epidemiology of adverse post-AKI events, association of AKI with late development of nonrenal adverse outcomes, use of bedside equations that facilitate prognostication of adverse renal outcomes of AKI, and how variability in serum creatinine values in individual patients, even among those with normal baseline renal function may indicate risk for the development of CKD. Use of common laboratory parameters such as serum creatinine and albumin, along with certain clinical and demographic markers, individualize patients at high risk of complications and in need of close postdischarge follow-up. Evidence that 'organ crosstalk' following a major AKI episode may increase the risk of heart failure, stroke, and hypertension, places its survivors in a special patient category deserving active efforts to minimize risk for cardiovascular events. Summary AKI is a major cause for acute in-hospital mortality and development of both late-stage CKD and cardiovascular events. Perioperative care to prevent AKI must challenge the notion that a single normal point of contact serum creatinine value substantially reduces the likelihood of its occurrence. Copyright © 2017 Wolters Kluwer Health, Inc. All rights reserved.

Database: EMBASE

6. Three-year outcomes after acute kidney injury: Results of a prospective parallel group cohort study

Author(s): Horne K.L.; Packington R.; Selby N.M.; Monaghan J.; Reilly T.

Source: BMJ Open; Mar 2017; vol. 7 (no. 3)

Publication Date: Mar 2017

Publication Type(s): Article

Available in full text at [BMJ Open](#) - from ProQuest

Available in full text at [BMJ Open](#) - from National Library of Medicine

Abstract: Objectives Using a prospective study design, we aimed to characterise the effect of acute kidney injury (AKI) on long-term changes in renal function in a general hospital population. Participants Hospitalised patients with AKI (exposed) and hospitalised patients without AKI (non-exposed), recruited at 3 months after hospital admission. Design Prospective, matched parallel group cohort study, in which renal function and proteinuria were measured at 3 months, 1 year and 3 years. Setting Single UK centre. Clinical end points Clinical end points at 3 years were comparison of the following variables between exposed and non-exposed groups: Renal function, prevalence of proteinuria and albuminuria and chronic kidney disease (CKD) progression/development at each time point. CKD progression was defined as a decrease in the estimated glomerular filtration rate (eGFR) of >25% associated with a decline in eGFR stage. Results 300 exposed and non-exposed patients were successfully matched 1:1 for age and baseline renal function; 70% of the exposed group had AKI stage 1. During follow-up, the AKI group had lower eGFR than non-exposed patients at each time point. At 3 years, the mean eGFR was 60.7+/-21 mL/min/1.73 m² in the AKI group compared with 68.4+/-21 mL/min/1.73 m² in the non-exposed group, p=0.003. CKD development or progression at 3 years occurred in 30 (24.6%) of the AKI group compared with 10 (7.5%) of the non-exposed group, p<0.001. Albuminuria was more common in the AKI group, and increased with AKI severity. Factors independently associated with CKD development/progression after AKI were non-recovery at 90 days, male gender, diabetes and recurrent AKI. Conclusions AKI is associated with deterioration in renal function to 3 years, even in an unselected population with predominantly AKI stage 1. Non-recovery from AKI is an important factor determining long-term outcome. Copyright © Published by the BMJ Publishing Group Limited.

Database: EMBASE

7. Hypoalbuminemia: a risk factor for acute kidney injury development and progression to chronic kidney disease in critically ill patients

Author(s): Shao M.; Wang S.; Parameswaran P.K.

Source: International Urology and Nephrology; Feb 2017; vol. 49 (no. 2); p. 295-302

Publication Date: Feb 2017

Publication Type(s): Article

Available in full text at [International Urology and Nephrology](#) - from Springer Link Journals

Abstract: Purpose: The increased likelihood of poor outcomes in critically ill patients with hypoalbuminemia is well recognized. However, hypoalbuminemia remains poorly defined as an independent predictor of acute kidney injury (AKI) and stage 4 chronic kidney diseases (CKD4). The aim of this study was to assess the role of hypoalbuminemia as an independent risk factor for AKI and CKD4 in critically ill patients. Design: A retrospective cohort study. Setting: General intensive care unit (ICU) at Anhui Provincial Hospital, PR China. Intervention: None. Measurements and main results: We screened patients admitted to the ICU at Anhui Provincial Hospital between January 1, 2008, and October 31, 2011, and included those aged >18 years with available records of serum

albumin (SA), baseline serum creatinine, and outcome data. The exclusion criteria were: (1) patients with known AKI and CKD stage 4, 5 before ICU admission; (2) patients lost to follow-up; and (3) patients without research authorization. A total of 588 patients with available data were enrolled in the study, and 62 patients with preexisting CKD stage 4 and CKD stage 5 and 115 with preexisting AKI were excluded. Thirty patients were lost to follow-up. Ultimately, 381 patients were analyzed, 233 (61.2%) of whom developed AKI. Patients with low SA were significantly more likely than those with normal SA ($p = 0.0003$) to develop AKI, and to progress from AKI to CKD4 ($p = 0.0229$). More patients in the AKI group than in the non-AKI group had risk factors such as hypotension, mechanical ventilation (MV), proteinuria, sepsis, nephrotoxin exposure, and high-risk surgery ($p < 0.001$) [odds ratio (OR) 1.810, 95% confidence interval (CI) 1.102-2.992, and OR 2.494, 95% CI 1.231-5.295, respectively]. After 4 years of follow-up, Kaplan-Meier analysis showed that survival in hypoalbuminemia patients was significantly shorter than in patients with normal SA ($p = 0.0393$). In the Cox proportional hazard model, hypoalbuminemia was an independent predictor of long-term mortality (hazard ratio 1.5, 95% CI 1.042-2.183, $p = 0.0291$). Conclusion: Hypoalbuminemia in critically ill patients is independently associated with an increased risk of development of AKI and AKI progressing to CKD4. Copyright © 2016, Springer Science+Business Media Dordrecht.

Database: EMBASE

8. Acute Kidney Injury Recovery Pattern and Subsequent Risk of CKD: An Analysis of Veterans Health Administration Data.

Author(s): Heung, Michael; Steffick, Diane E; Zivin, Kara; Gillespie, Brenda W; Banerjee, Tanushree; Hsu, Chi-Yuan; Powe, Neil R; Pavkov, Meda E; Williams, Desmond E; Saran, Rajiv; Shahinian, Vahakn B; Centers for Disease Control and Prevention CKD Surveillance Team

Source: American journal of kidney diseases : the official journal of the National Kidney Foundation; May 2016; vol. 67 (no. 5); p. 742-752

Publication Date: May 2016

Publication Type(s): Journal Article Research Support, U.S. Gov't, P.h.s.

Abstract: BACKGROUND Studies suggest an association between acute kidney injury (AKI) and long-term risk for chronic kidney disease (CKD), even following apparent renal recovery. Whether the pattern of renal recovery predicts kidney risk following AKI is unknown. STUDY DESIGN Retrospective cohort. SETTING & PARTICIPANTS Patients in the Veterans Health Administration in 2011 hospitalized (> 24 hours) with at least 2 inpatient serum creatinine measurements, baseline estimated glomerular filtration rate > 60 mL/min/1.73 m², and no diagnosis of end-stage renal disease or non-dialysis-dependent CKD: 17,049 (16.3%) with and 87,715 without AKI. PREDICTOR Pattern of recovery to creatinine level within 0.3 mg/dL of baseline after AKI: within 2 days (fast), in 3 to 10 days (intermediate), and no recovery by 10 days (slow or unknown). OUTCOME CKD stage 3 or higher, defined as 2 outpatient estimated glomerular filtration rates < 60 mL/min/1.73 m² at least 90 days apart or CKD diagnosis, dialysis therapy, or transplantation. MEASUREMENTS Risk for CKD was modeled using modified Poisson regression and time to death-censored CKD was modeled using Cox proportional hazards regression, both stratified by AKI stage. RESULTS Most patients' AKI episodes were stage 1 (91%) and 71% recovered within 2 days. At 1 year, 18.2% had developed CKD (AKI, 31.8%; non-AKI, 15.5%; $P < 0.001$). In stage 1, the adjusted relative risk ratios for CKD stage 3 or higher were 1.43 (95% CI, 1.39-1.48), 2.00 (95% CI, 1.88-2.12), and 2.65 (95% CI, 2.51-2.80) for fast, intermediate, and slow/unknown recovery. A similar pattern was observed in subgroup analyses incorporating albuminuria and sensitivity analysis of death-censored time to CKD. LIMITATIONS Variable timing of follow-up and mostly male veteran cohort may limit generalizability. CONCLUSIONS Patients who develop AKI during a hospitalization are at substantial

risk for the development of CKD by 1 year following hospitalization and timing of AKI recovery is a strong predictor, even for the mildest forms of AKI.

Database: Medline

9. The long-term outcome after acute kidney injury: a narrative review.

Author(s): Pôncio, Luana; Balbi, Andre Luis; Rocha, Érica Pires da; Dias, Dayana Bitencourt; Ponce, Daniela

Source: Jornal brasileiro de nefrologia : 'orgao oficial de Sociedades Brasileira e Latino-Americana de Nefrologia; 2015; vol. 37 (no. 1); p. 115-120

Publication Date: 2015

Publication Type(s): Journal Article Review

Abstract: This review will focus on long-term outcomes after acute kidney injury (AKI). Surviving AKI patients have a higher late mortality compared with those admitted without AKI. Recent studies have claimed that long-term mortality in patients after AKI varied from 15% to 74% and older age, presence of previous co-morbidities, and the incomplete recovery of renal function have been identified as risk factors for reduced survival. AKI is also associated with progression to chronic kidney (CKD) disease and the decline of renal function at hospital discharge and the number and severity of AKI episodes have been associated with progression to CKD. IN the most studies, recovery of renal function is defined as non-dependence on renal replacement therapy which is probably too simplistic and it is expected in 60-70% of survivors by 90 days. Further studies are needed to explore the long-term prognosis of AKI patients.

Database: Medline

10. Risk Factors for Long-Term Mortality and Progressive Chronic Kidney Disease Associated With Acute Kidney Injury After Cardiac Surgery.

Author(s): Xu, Jia-Rui; Zhu, Jia-Ming; Jiang, Jun; Ding, Xiao-Qiang; Fang, Yi; Shen, Bo; Liu, Zhong-Hua; Zou, Jian-Zhou; Liu, Lan; Wang, Chun-Sheng; Ronco, Claudio; Liu, Hong; Teng, Jie

Source: Medicine; Nov 2015; vol. 94 (no. 45); p. e2025

Publication Date: Nov 2015

Publication Type(s): Research Support, Non-u.s. Gov't Clinical Trial Journal Article

Available in full text at [Medicine](#). - from Ovid

Available in full text at [Medicine](#) - from National Library of Medicine

Abstract: The aim of the study was to evaluate risk factors for long-term mortality and progressive chronic kidney disease (CKD) after cardiac surgery in patients with normal preoperative renal function and postoperative acute kidney injury (AKI). From April 2009 to December 2012, we prospectively enrolled 3245 cardiac surgery patients of our hospital. The primary endpoints included survival rates and the secondary endpoint was the incidence of progressive chronic kidney disease (CKD) in a follow-up period of 2 years. Acute kidney injury was staged by KDIGO classification. Progressive CKD was defined as GFR \leq 30 mL/min/1.73 m or end-stage renal disease (ESRD) (starting renal replacement therapy or renal transplantation). The AKI incidence was 39.9% (n = 1295). The 1 and 2 year overall survival (OS) rates of AKI patients were significantly lower than that for non-AKI patients (85.9% and 82.3% vs 98.1% and 93.7%, $P < 0.001$), even after complete recovery of renal function during 2 years after intervention ($P < 0.001$). The 2-year overall survival (OS) rates of patients with AKI stage 1, 2, and 3 were 89.9%, 78.6%, and 61.4% ($P < 0.001$), respectively.

Multivariate Cox regression analysis of factors for 2-year survival rates revealed that besides age ($P < 0.001$), chronic cardiac failure ($P < 0.001$), diabetes ($P < 0.001$), cardiopulmonary bypass time ($P < 0.01$), and length of intensive care unit (ICU) stay ($P = 0.004$), AKI was a significant risk factor for reducing 2-year survival rates even after complete recovery of renal function ($P < 0.001$). The accumulated progressive CKD prevalence was significantly higher in AKI than in non-AKI patients (6.8% vs 0.2%, $P < 0.001$) in the 2 years after surgery. Even with complete recovery of renal function at discharge, AKI was still a risk factor for accumulated progressive CKD (RR 1.92, 95% CI 1.37-2.69). The 2-year mortality and progressive CKD incidence even after complete recovery of renal function were significantly increased in cardiac surgery patients with postoperative AKI.

Database: Medline

11. Acute kidney injury: gateway to chronic kidney disease.

Author(s): Heung, Michael; Chawla, Lakhmir S

Source: Nephron. Clinical practice; 2014; vol. 127 (no. 1-4); p. 30-34

Publication Date: 2014

Publication Type(s): Journal Article Review

Abstract: This review examines the evidence linking acute kidney injury (AKI) with the risk of subsequently developing chronic kidney disease (CKD). The discussion focuses on subjects that recover from an episode of AKI, most of whom do not receive follow-up nephrology care. Many recent studies have shown a strong association between AKI and the risk of developing CKD. Preclinical models provide evidence for a causal link between AKI and CKD while also proposing some of the potential mechanisms for this progression. Large observational studies have begun to quantify the risk for CKD following AKI recovery and identify risk factors for the development of CKD. In summary, there is an association between AKI with incomplete recovery or lack of recovery and CKD. Multiple studies now suggest that even AKI with apparent full recovery confers an independent risk for later development of CKD. Severity of AKI, baseline CKD, and multiple episodes of AKI remain consistent risk factors for CKD after AKI. The proposed risk prediction models that have been developed require further refinement and validation. The identification of patients with AKI recovery who are at high risk for later CKD development remains an important clinical and research goal.

Database: Medline

12. The effects of acute kidney injury on long-term renal function and proteinuria in a general hospitalised population.

Author(s): Horne, Kerry L; Packington, Rebecca; Monaghan, John; Reilly, Timothy; McIntyre, Christopher W; Selby, Nicholas M

Source: Nephron. Clinical practice; 2014; vol. 128 (no. 1-2); p. 192-200

Publication Date: 2014

Publication Type(s): Journal Article

Abstract: **BACKGROUND** Acute kidney injury (AKI) is common in hospitalised patients and is associated with adverse long-term consequences. There is an urgent need to understand these sequelae in general hospitalised patients utilising a prospective cohort-based approach. We aimed to test the feasibility of study methodology prior to commencing a large-scale study and investigate the effects of AKI on chronic kidney disease (CKD) progression and proteinuria. **METHODS** Pilot study testing novel methodology for remote patient recruitment within a prospective case-control design. 300 cases (hospitalised patients with AKI) and controls (hospitalised patients without AKI) were matched 1:1 for age and baseline estimated glomerular filtration rate (eGFR). 70% of cases had AKI

stage 1, 16% AKI stage 2 and 14% AKI stage 3. Renal function and proteinuria were measured 3 and 12 months after hospital admission. **RESULTS** The study met pre-defined recruitment, withdrawal and matching criteria. Renal function was worse in the AKI group at 3 (eGFR 61 ± 20 vs. 74 ± 23 ml/min/1.73 m²), $p < 0.001$) and 12 months (eGFR 64 ± 23 vs. 75 ± 25 ml/min/1.73 m²), $p < 0.001$). More cases than controls had CKD progression at 3 months (14 vs. 0.7%, $p < 0.001$). This difference persisted to 12 months, but there was no significant change between 3 and 12 months. Proteinuria and albuminuria were more prevalent in the AKI group and associated with CKD progression. **CONCLUSIONS** We describe a method of remote patient recruitment which could be employed more widely for prospective observational studies. Even mild AKI is associated with long-term renal dysfunction. Further investigation using this methodology is now underway.

Database: Medline

13. Acute kidney injury and chronic kidney disease as interconnected syndromes.

Author(s): Chawla, Lakhmir S; Eggers, Paul W; Star, Robert A; Kimmel, Paul L

Source: The New England journal of medicine; Jul 2014; vol. 371 (no. 1); p. 58-66

Publication Date: Jul 2014

Publication Type(s): Journal Article Review

Available in full text at [New England Journal of Medicine, The](#) - from ProQuest

Available in full text at [New England Journal of Medicine](#) - from Massachusetts Medical Society ;

Notes: Please select 'Login via Athens or your institution' and enter your OpenAthens username and password.

Database: Medline

14. Acute kidney failure requiring renal replacement therapy: Risk factors and outcome of follow-up in the first year

Author(s): Sanchidrian S.G.; Cebrian Andrada C.J.; Jimenez Herrero M.C.; Deira Lorenzo J.L.; Labrador Gomez P.J.; Marin Alvarez J.P.; Garcia-Bernalt Funes V.; Dominguez S.G.; Cervino I.C.; Arroyo J.R.G.-M.

Source: Nephrology Dialysis Transplantation; May 2014; vol. 29

Publication Date: May 2014

Publication Type(s): Conference Abstract

Available in full text at [Nephrology Dialysis Transplantation](#) - from Oxford University Press ;

Collection notes: To access please select Login with Athens and search and select NHS England as your institution before entering your NHS OpenAthens account details.

Available in full text at [Nephrology Dialysis Transplantation](#) - from Highwire Press

Abstract: Introduction and Aims: Acute kidney injury (AKI) is an important public health problem. AKI is a risk factor for progression of kidney disease, incidence of chronic kidney disease (CKD) and mortality. The aim of the study was to assess characteristics, renal survival and mortality of patients who developed AKI stage 3, according to KDIGO guidelines, and needed renal replacement therapy (RRT), not in intensive care unit. Methods: All patients who required RRT due to AKI stage 3 along two years were included, excluding patients in intensive care unit. Demographic and personal history data, previous renal function, cause of AKI, renal function, renal survival, and mortality at one, three, six and twelve months after AKI were recorded. Results: A total of 107 patients were enrolled (incidence 134 patients/106 population/ year). Mean age 72.2 ± 13.9 (range 25-92), 57.9% men. Patient's characteristics: 77.6% were hypertensive, 40.2% were diabetics, 45.8% were dyslipemics,

41.1% were obese, 27.1% were smokers, and 61.2% with chronic renal failure (eFG<60ml/min) of which 54% stage 3, 36.5% stage 4, and 9.5% stage 5. Cause of AKI: renal disease 63.6%, prerenal 28.9% and obstructive causes 7.5%. Renal function: Serum creatinine before AKI 1.78+/-1.12 mg/dL; maximum serum creatinine during AKI hospitalization 7.39 +/-4.43mg/dL; at discharge, 2.64+/-1.62mg/dL; one month later, 2.07+/-1.36mg/dL; three months later, 2.35+/-1.60mg/dL; six months later, 2.25+/-1.85mg/dL and one year later, 1.95+/-1.14 mg/dL. During hospitalization, 24.3% died, 16.8% kept on RRT at discharge, and 58.9% recovered partial or completely renal function. One month after AKI, 31.7% had died, 15.8% kept on RRT, and 52.5% preserved renal function, 5.6% was missing. Three months later, 45.7% died, 10.9% kept on RRT, and 43.5% preserved renal function, 14% was missing. Six months later, 48.3% had die, 10% kept on RRT, and 33.3% preserved renal function, 8.3% were missing. Finally, one year after AKI, 71.8% of patients had died, 9.9% needed RRT, 18.3% recovered partial or completely renal function and 33.6% missing. AKI in diabetic or dyslipemic patients has an increased mortality (p=0.03 and p=0.06 respectively). CKD before AKI is not associated with increased mortality. Renal function according to KDOQI classification of patients who had AKI stage 3 was: at discharge: stage 1 1.6%, 2 16.1%, 3 24.2%, 4 37.1% and 5 21.0%; three months after AKI : stage 1 2.5%, 2 15%, 3 30%, 4 32.5% and 5 17.5%; six months after AKI: 1 6.5%, 2 12.9%, 3 38.7%, 4 19.4% and 5 19.4% and one year after AKI, renal function was: 2 25%, 3 41.7%, 4 25% and 5 8.3%. Conclusions: In our health area AKI stage 3 requiring RRT have a incidence similar to other studies. Mortality in AKI patients exceeds 70% one year after AKI episode and renal survival decreases in this period. Nephrology follow-up must be established in patients who survive AKI. The develop of tools to identify high-risk patients and to promote renal recovery is important to reduce burden of CKD and mortality.

Database: EMBASE

15. The link between acute kidney injury and chronic kidney disease.

Author(s): Belayev, Linda Y; Palevsky, Paul M

Source: Current opinion in nephrology and hypertension; Mar 2014; vol. 23 (no. 2); p. 149-154

Publication Date: Mar 2014

Publication Type(s): Journal Article

Available in full text at [Current Opinion in Nephrology and Hypertension](#) - from Ovid

Abstract: PURPOSE OF REVIEW It has been argued that the existing epidemiologic data are insufficient to establish a causal link between acute kidney injury (AKI) and subsequent development or progression of chronic kidney disease (CKD), especially given that risk factors for the development of AKI overlap with those for progressive CKD. RECENT FINDINGS Multiple studies published over the past 5 years have demonstrated a strong epidemiologic association between episodes of AKI and subsequent development or progression of CKD, including evidence that severity of AKI and repeated episodes of AKI are associated with increased risk of CKD. In addition, animal models have provided evidence for a biological basis linking episodes of AKI with CKD. SUMMARY The preponderance of data support a causal link between episodes of AKI and subsequent development or progression of CKD.

Database: Medline

16. Acute kidney injury and chronic kidney disease: it's a two-way street.

Author(s): Kline, Jason; Rachoin, Jean-Sebastien

Source: Renal failure; 2013; vol. 35 (no. 4); p. 452-455

Publication Date: 2013

Publication Type(s): Journal Article Review

Abstract:Acute kidney injury (AKI) is frequently seen in hospitalized patients and its incidence increases with the severity of illness. Recent studies have further illuminated the interdependent relationship between AKI and chronic kidney disease (CKD). CKD and proteinuria have been demonstrated to be risk factors for AKI. Moreover, the previous dogma that prognosis is excellent for patients who recover after AKI episodes may not be universally accurate as CKD is emerging as a long-term consequence after AKI. Short-term mortality is lower in CKD patients with AKI.

Database: Medline

17. Pre-eclampsia and the risk of kidney disease.

Author(s): Vikse, Bjørn Egil

Source: Lancet (London, England); Jul 2013; vol. 382 (no. 9887); p. 104-106

Publication Date: Jul 2013

Publication Type(s): Journal Article

Available in full text at [Lancet, The](#) - from ProQuest

Available in print at [Patricia Bowen Library and Knowledge Service West Middlesex university Hospital](#) - from The Lancet

Database: Medline

18. Bidirectional relationships between acute kidney injury and chronic kidney disease.

Author(s): Pannu, Neesh

Source: Current opinion in nephrology and hypertension; May 2013; vol. 22 (no. 3); p. 351-356

Publication Date: May 2013

Publication Type(s): Journal Article Review

Available in full text at [Current Opinion in Nephrology and Hypertension](#) - from Ovid

Abstract:PURPOSE OF REVIEWChronic kidney disease (CKD) remains one of the most potent predictors of acute kidney injury (AKI); however, recent epidemiologic studies have demonstrated a complex interplay between these two clinical entities. A growing body of evidence supports a bidirectional relationship: AKI leads to CKD, and the presence of CKD increases the risk of AKI. Additionally, several studies suggest that the presence of underlying CKD does modify the relation between AKI and adverse outcomes. In this article, we will review recent studies supporting the hypothesis that AKI leads to CKD and will explore the role of CKD as an effect modifier for AKI.RECENT FINDINGSA recent meta-analysis confirms the association between AKI and the development of CKD and end-stage renal disease. Patient survival and renal outcomes after AKI are influenced by the presence of underlying CKD. AKI survivors with complete recovery of renal function remain at elevated risk of developing de-novo CKD, which may influence long-term survival; however, recovery of kidney function after AKI is associated with better long-term survival and renal function.SUMMARYRecent findings support a strong association between AKI and CKD. There is uncertainty as to whether this relationship is causal. CKD is an effect modifier in AKI.

Database: Medline

19. Recovery from AKI and short- and long-term outcomes after lung transplantation.

Author(s): Wehbe, Edgard; Duncan, Andra E; Dar, Gohar; Budev, Marie; Stephany, Brian

Source: Clinical journal of the American Society of Nephrology : CJASN; Jan 2013; vol. 8 (no. 1); p. 19-25

Publication Date: Jan 2013

Publication Type(s): Research Support, N.i.h., Extramural Journal Article

Available in full text at [Clinical Journal of the American Society of Nephrology](#) - from Highwire Press

Available in full text at [Clinical Journal of the American Society of Nephrology : CJASN](#) - from National Library of Medicine

Abstract:BACKGROUND AND OBJECTIVESPatients with AKI after lung transplantation are at increased risk for CKD and death. Whether patients who completely recover from AKI have improved long-term outcome compared with patients who do not completely recover remains unknown.DESIGN, SETTING, PARTICIPANTS, & MEASUREMENTSThis study retrospectively evaluated data on 657 patients who underwent lung transplantation from 1997 to 2009. Outcomes analyzed were the incidence of renal recovery after AKI and the association of this recovery with short- and long-term mortality. AKI was defined by an absolute increase in serum creatinine of ≥ 0.3 mg/dl or a percent increase in serum creatinine of $\geq 50\%$ from baseline at any time during the first 2 weeks after transplantation.RESULTSFour hundred twenty-four (65%) patients experienced AKI in the first 2 weeks after transplantation. Of these patients, complete renal recovery occurred in 142 (33%) patients. The incidence of in-hospital complications was similar between patients who recovered renal function and patients without recovery. At 1 year, the cumulative incidence of CKD was 14% and 22% ($P=0.10$) and patient survival rate was 81% and 76% ($P=0.20$) in patients with complete recovery from AKI and patients without recovery, respectively. Patients with completely recovered AKI had similar risk-adjusted long-term mortality compared with patients who did not recover (hazard ratio [95% confidence interval]=1.42 [1.15-2.05] versus 1.53 [1.01-2.00]).CONCLUSIONSPatients who recover completely from early AKI after lung transplantation have a similar risk for CKD and long-term mortality compared with patients who do not recover.

Database: Medline

20. Long-term sequelae of acute kidney injury in the ICU.

Author(s): Cohen, Scott D; Kimmel, Paul L

Source: Current opinion in critical care; Dec 2012; vol. 18 (no. 6); p. 623-628

Publication Date: Dec 2012

Publication Type(s): Journal Article Review

Available in full text at [Current Opinion in Critical Care](#) - from Ovid

Abstract:PURPOSE OF REVIEWAcute kidney injury (AKI) in the ICU is associated with adverse outcomes. We review the long-term consequences of AKI in ICU patients.RECENT FINDINGSObservational studies show associations between AKI and mortality, prolonged length of ICU stay, dependence on mechanical ventilation, the development and progression of chronic kidney disease (CKD), and need for permanent renal replacement therapy. Few studies evaluate ICU AKI outcomes specifically, and data on long-term outcomes of survivors from this population are sparse. Little information exists comparing AKI in ICU and non-ICU settings, and prospective study designs to address such questions are problematic. AKI in the ICU should be distinguished from AKI in other clinical settings, as the underlying pathophysiology, severity of illness, and risk for permanent

sequelae may be different. AKI and CKD are not mutually exclusive, but are part of a clinical spectrum in which AKI can potentiate the risk for CKD and pre-existing CKD increases risks of AKI. SUMMARY Further research is necessary to delineate the mechanisms by which AKI may lead to CKD, and to understand how CKD enhances the risk for developing AKI. Whereas retrospective observational studies of this population exist, prospective clinical studies and trials evaluating the long-term clinical outcomes of AKI specifically in ICU patients are needed.

Database: Medline

21. Acute kidney injury and chronic kidney disease: an integrated clinical syndrome.

Author(s): Chawla, Lakhmir S; Kimmel, Paul L

Source: Kidney international; Sep 2012; vol. 82 (no. 5); p. 516-524

Publication Date: Sep 2012

Publication Type(s): Journal Article Review

Available in full text at [Kidney International](#) - from ProQuest

Abstract: The previous conventional wisdom that survivors of acute kidney injury (AKI) tend to do well and fully recover renal function appears to be flawed. AKI can cause end-stage renal disease (ESRD) directly, and increase the risk of developing incident chronic kidney disease (CKD) and worsening of underlying CKD. In addition, severity, duration, and frequency of AKI appear to be important predictors of poor patient outcomes. CKD is an important risk factor for the development and ascertainment of AKI. Experimental data support the clinical observations and the bidirectional nature of the relationships between AKI and CKD. Reductions in renal mass and nephron number, vascular insufficiency, cell cycle disruption, and maladaptive repair mechanisms appear to be important modulators of progression in patients with and without coexistent CKD. Distinction between AKI and CKD may be artificial. Consideration should be given to the integrated clinical syndrome of diminished GFR, with acute and chronic stages, where spectrum of disease state and outcome is determined by host factors, including the balance of adaptive and maladaptive repair mechanisms over time. Physicians must provide long-term follow-up to patients with first episodes of AKI, even if they presented with normal renal function.

Database: Medline

22. Does AKI truly lead to CKD?

Author(s): Rifkin, Dena E; Coca, Steven G; Kalantar-Zadeh, Kamyar

Source: Journal of the American Society of Nephrology : JASN; Jun 2012; vol. 23 (no. 6); p. 979-984

Publication Date: Jun 2012

Publication Type(s): Research Support, Non-u.s. Gov't Research Support, N.i.h., Extramural Journal Article Review

Available in full text at [Journal of the American Society of Nephrology](#) - from Free Access Content

Available in full text at [Journal of the American Society of Nephrology](#) - from Highwire Press

Abstract:Acute kidney injury (AKI) has been implicated as an independent risk factor for the development of CKD in recent observational studies. The presumption in the nephrology community is that this association represents a causal relationship. However, because of potential problems related to residual confounding (shared risk factors), ascertainment bias (sicker patients have more follow-up assessments), misclassification of exposure (problems with defining baseline kidney function and AKI representing a discrete event versus progression of renal disease), and misclassification of outcome (de novo CKD versus CKD progression), it is difficult to conclude with certainty that AKI is truly causal for CKD. In this review we highlight several of the Hill causality criteria to examine the existing evidence and point out the missing elements that preclude defining AKI as a cause of CKD in the general population. Only well-designed studies with rigorous assessment of kidney function in all participants (AKI and non-AKI) before and after the episode or hospitalization or randomized, controlled trials demonstrating that prevention or treatment of AKI reduces the incidence of subsequent CKD can clarify the causal nature of the AKI-CKD relationship.

Database: Medline

23. Increased risk of death and de novo chronic kidney disease following reversible acute kidney injury

Author(s): Bucaloiu I.D.; Norfolk E.R.; Hartle II J.E.; Kirchner H.L.; Perkins R.M.

Source: Kidney International; Dec 2011

Publication Date: Dec 2011

Publication Type(s): Article In Press

Available in full text at [Kidney International](#) - from ProQuest

Abstract:Acute kidney injury increases mortality risk among those with established chronic kidney disease. In this study we used a propensity score-matched cohort method to retrospectively evaluate the risks of death and de novo chronic kidney disease after reversible, hospital-associated acute kidney injury among patients with normal pre-hospitalization kidney function. Of 30,207 discharged patients alive at 90 days, 1610 with reversible acute kidney injury that resolved within the 90 days were successfully matched across multiple parameters with 3652 control patients who had not experienced acute kidney injury. Median follow-up was 3.3 and 3.4 years (injured and control groups, respectively). In Cox proportional hazard models, the risk of death associated with reversible acute kidney injury was significant (hazard ratio 1.50); however, adjustment for the development of chronic kidney injury during follow-up attenuated this risk (hazard ratio 1.18). Reversible acute kidney injury was associated with a significant risk of de novo chronic kidney disease (hazard ratio 1.91). Thus, a resolved episode of hospital-associated acute kidney injury has important implications for the longitudinal surveillance of patients without preexisting, clinically evident kidney disease. Kidney International advance online publication, 7 December 2011; doi:10.1038/ki.2011.405.

Database: EMBASE

24. Acute kidney injury episodes and chronic kidney disease risk in diabetes mellitus.

Author(s): Thakar, Charuhas V; Christianson, Annette; Himmelfarb, Jonathan; Leonard, Anthony C

Source: Clinical journal of the American Society of Nephrology : CJASN; Nov 2011; vol. 6 (no. 11); p. 2567-2572

Publication Date: Nov 2011

Publication Type(s): Research Support, U.s. Gov't, Non-p.h.s. Journal Article

Available in full text at [Clinical Journal of the American Society of Nephrology](#) - from Highwire Press

Available in full text at [Clinical Journal of the American Society of Nephrology : CJASN](#) - from National Library of Medicine

Abstract:BACKGROUND AND OBJECTIVESPrior studies have examined long-term outcomes of a single acute kidney injury (AKI) event in hospitalized patients. We examined the effects of AKI episodes during multiple hospitalizations on the risk of chronic kidney disease (CKD) in a cohort with diabetes mellitus (DM).DESIGN, SETTING, PARTICIPANTS, & MEASUREMENTSA total of 4082 diabetics were followed from January 1999 until December 2008. The primary outcome was reaching stage 4 CKD (GFR of 0.3 mg/dl or a 1.5-fold increase in creatinine relative to admission. Cox survival models examined the effect of first AKI episode and up to three episodes as time-dependent covariates, on the risk of stage 4 CKD. Covariates included demographic variables, baseline creatinine, and diagnoses of comorbidities including proteinuria.RESULTSO f the 3679 patients who met eligibility criteria (mean age = 61.7 years [SD, 11.2]; mean baseline creatinine = 1.10 mg/dl [SD, 0.3]), 1822 required at least one hospitalization during the time under observation (mean = 61.2 months [SD, 25]). Five hundred thirty of 1822 patients experienced one AKI episode; 157 of 530 experienced ≥ 2 AKI episodes. In multivariable Cox proportional hazards models, any AKI versus no AKI was a risk factor for stage 4 CKD (hazard ratio [HR], 3.56; 95% confidence interval [CI], 2.76, 4.61); each AKI episode doubled that risk (HR, 2.02; 95% CI, 1.78, 2.30).CONCLUSIONSAKI episodes are associated with a cumulative risk for developing advanced CKD in diabetes mellitus, independent of other major risk factors of progression.

Database: Medline

25. The severity of acute kidney injury predicts progression to chronic kidney disease.

Author(s): Chawla, Lakhmir S; Amdur, Richard L; Amodeo, Susan; Kimmel, Paul L; Palant, Carlos E

Source: Kidney international; Jun 2011; vol. 79 (no. 12); p. 1361-1369

Publication Date: Jun 2011

Publication Type(s): Research Support, Non-u.s. Gov't Research Support, U.s. Gov't, Non-p.h.s. Journal Article Validation Studies

Available in full text at [Kidney International](#) - from ProQuest

Abstract:Acute kidney injury (AKI) is associated with progression to advanced chronic kidney disease (CKD). We tested whether patients who survive AKI and are at higher risk for CKD progression can be identified during their hospital admission, thus providing opportunities to intervene. This was assessed in patients in the Department of Veterans Affairs Healthcare System hospitalized with a primary diagnosis indicating AKI (ICD9 codes 584.xx). In the exploratory phase, three multivariate prediction models for progression to stage 4 CKD were developed. In the confirmatory phase, the models were validated in 11,589 patients admitted for myocardial infarction or pneumonia during the same time frame that had RIFLE codes R, I, or F and complete data for all predictor variables. Of the 5351 patients in the AKI group, 728 entered stage 4 CKD after hospitalization. Models 1, 2, and 3 were all significant with 'c' statistics of 0.82, 0.81, and 0.77, respectively. In model validation, all three were highly significant when tested in the confirmatory patients, with moderate to large effect

sizes and good predictive accuracy ('c' 0.81-0.82). Patients with AKI who required dialysis and then recovered were at especially high risk for progression to CKD. Hence, the severity of AKI is a robust predictor of progression to CKD.

Database: Medline

26. Long-term outcomes of acute kidney injury

Author(s): Coca S.G.

Source: Current Opinion in Nephrology and Hypertension; May 2010; vol. 19 (no. 3); p. 266-272

Publication Date: May 2010

Publication Type(s): Review

Available in full text at [Current Opinion in Nephrology and Hypertension](#) - from Ovid

Abstract: PURPOSE OF REVIEW: The goal of this review is to summarize the recent plethora of data that relate to long-term outcomes after acute kidney injury (AKI). RECENT FINDINGS: Surviving patients with AKI are still at high risk for long-term adverse outcomes, even if serum creatinine returns to normal. After adjusting for potential confounders, many recent studies have demonstrated that AKI is independently associated with chronic kidney disease, end-stage renal disease, and premature death. Unfortunately, definitive evidence from randomized controlled trials demonstrating that prevention or treatment of AKI prevents long-term adverse outcomes is not yet available. SUMMARY: AKI is clearly a prognostic marker for poor long-term outcomes, but more studies will be needed to determine whether AKI is truly causal and whether or not the risk is modifiable. © 2010 Wolters Kluwer Health Lippincott Williams & Wilkins.

Database: EMBASE

27. Dialysis-requiring acute renal failure increases the risk of progressive chronic kidney disease.

Author(s): Lo, Lowell J; Go, Alan S; Chertow, Glenn M; McCulloch, Charles E; Fan, Dongjie; Ordoñez, Juan D; Hsu, Chi-yuan

Source: Kidney international; Oct 2009; vol. 76 (no. 8); p. 893-899

Publication Date: Oct 2009

Publication Type(s): Research Support, N.i.h., Extramural Journal Article

Available in full text at [Kidney International](#) - from ProQuest

Available in full text at [Kidney International](#) - from Nature Publishing Group

Abstract: To determine whether acute renal failure (ARF) increases the long-term risk of progressive chronic kidney disease (CKD), we studied the outcome of patients whose initial kidney function was normal or near normal but who had an episode of dialysis-requiring ARF and did not develop end-stage renal disease within 30 days following hospital discharge. The study encompassed 556,090 adult members of Kaiser Permanente of Northern California hospitalized over an 8 year period, who had pre-admission estimated glomerular filtration rates (eGFR) equivalent to or greater than 45 ml/min/1.73 m² and who survived hospitalization. After controlling for potential confounders such as baseline level of eGFR and diabetes status, dialysis-requiring ARF was independently associated with a 28-fold increase in the risk of developing stage 4 or 5 CKD and more than a twofold increased risk of death. Our study shows that in a large, community-based cohort of patients with pre-existing normal or near normal kidney function, an episode of dialysis-requiring ARF was a strong independent risk factor for a long-term risk of progressive CKD and mortality.

Database: Medline

28. Acute kidney injury as a risk and progression factor for chronic kidney injury.

Author(s): Schiffil, H; Lang, S

Source: Minerva urologica e nefrologica = The Italian journal of urology and nephrology; Sep 2009; vol. 61 (no. 3); p. 159-169

Publication Date: Sep 2009

Publication Type(s): Journal Article

Abstract:Acute kidney injury is common in hospitalized patients and is associated with significant in-hospital morbidity and mortality. However, hospital-acquired acute kidney injury is neither a harmless complication of severe underlying diseases nor a life threatening short-term illness. Posthospital discharge follow-up of patients highlights that survivors of acute kidney injury may develop serious long-term sequelae. Long-term mortality is greater in those patients who survived acute kidney injury when compared with critically or non-critically ill patients without acute kidney injury. Among survivors of acute kidney injury at long-term follow-up approximately 12.5% may be dialysis dependent and 19-31% may have chronic kidney disease. The incidence of end-stage renal disease secondary to acute kidney injury will likely continue to increase with more elderly patients treated in Intensive Care Units, with a higher burden of extra renal and renal comorbid diseases. Nephrologists should recognize acute kidney injury as an underestimated cause of chronic kidney disease and patients who survive with incomplete recovery should be followed closely for new chronic kidney disease or progression of pre-existing chronic kidney disease. Non-recovery or re-need for dialysis are not only important determinants of long-term health status, quality of life and mortality of these patients, but add also a burden to health resources.

Database: Medline

29. Long-term functional evolution after an acute kidney injury: a 10-year study.

Author(s): Ponte, Belén; Felipe, Carmen; Muriel, Alfonso; Tenorio, Maria Teresa; Liaño, Fernando

Source: Nephrology, dialysis, transplantation : official publication of the European Dialysis and Transplant Association - European Renal Association; Dec 2008; vol. 23 (no. 12); p. 3859-3866

Publication Date: Dec 2008

Publication Type(s): Journal Article

Available in full text at [Nephrology Dialysis Transplantation](#) - from Oxford University Press ;
Collection notes: To access please select Login with Athens and search and select NHS England as your institution before entering your NHS OpenAthens account details.

Available in full text at [Nephrology Dialysis Transplantation](#) - from Highwire Press

Abstract:BACKGROUNDData on long-term effects of acute kidney injury (AKI) on renal function (RF) are scarce and factors implicated in the functional outcome are not established. Our aim was to investigate these aspects.METHODSAt hospital discharge and annually for 10 years, we retrospectively reviewed RF of 187 patients surviving AKI. Glomerular filtration rates estimated with MDRD equation (eGFR) and KDOQI stages were used to evaluate RF. Only 34.8% of patients had pre-existing renal dysfunction (KDOQI-3). Variables determining long-term RF were collected during AKI and at discharge and analysed with a regression model.RESULTSAt discharge no patient necessitated dialysis, but eGFR was lower than baseline (47.5 ± 23.3 ml/min/1.73 m²) versus 75.8 ± 25.4 ml/min/1.73 m²); 38.4% of survivors had recovered basal RF: 26% of those with previous normal RF and 61% of those in KDOQI-3, respectively. At 1 year, eGFR increased to 61.9 ± 24.4 ml/min/1.73 m² and remained stable later. During an 8-year median follow-up (P25:2; P75:10), 31% improved RF, 50% remained stable and 19% deteriorated. In total only 46% (n = 82) definitively

recovered RF. Finally, at the end of the study period 61.6% presented some degree of renal dysfunction: 40% of those with previous normal RF developed moderate-severe renal dysfunction and 37% KDOQI-3 progressed into more severe renal failure. Only two patients needed dialysis. Regression model identified age, co-morbidities, discharge eGFR and follow-up time as independent predictors of long-term RF. CONCLUSIONS AKI carries implication for long-term RF even in patients without pre-existing renal dysfunction. Ageing, co-morbidities and RF at discharge are determinants of the long-term functional outcome.

Database: Medline

30. The effects of acute renal failure on long-term renal function.

Author(s): Salmanullah, Mohammad; Sawyer, Robert; Hise, Michael K

Source: Renal failure; Mar 2003; vol. 25 (no. 2); p. 267-276

Publication Date: Mar 2003

Publication Type(s): Journal Article

Abstract: The relationship between acute renal failure (ARF) and long-term renal function remains unknown. We therefore undertook a study of patients at the Baltimore VA Hospital to examine the effects of a bout of acute renal injury on long-term renal function. We retrospectively reviewed the relationship between serum creatinine and time of observation for 6058 individuals who had values greater than 1.4 mg/dL in any two consecutive years. Individuals were stratified according to total years of observation with a minimum of two years. Severity of acute renal injury was divided into mild, moderate, and severe with elevations in baseline creatinine of 300% respectively. Sporadic elevations in creatinine were evident in 8-15% of the population. There were a total of 1328 episodes of acute renal failure in 916 patients that were suitable for analysis. Mild ARF on a substrate of normal or mildly abnormal renal function resolved without long-term sequelae. Moderate and severe ARF occurred more frequently on a background of reduced renal function but baseline function was retained in at least 60% of patients. We conclude that ARF is more frequent in patients with chronic kidney disease but it is not invariably associated with an accelerated course to end-stage renal disease or death. Overall, the majority of ARF events resolved without adverse long-term effects suggesting appropriate management in the majority of instances.

Database: Medline

Strategy 190561

#	Database	Search term	Results
1	Medline	exp "ACUTE KIDNEY INJURY"/	38715
2	Medline	("acute kidney injur*").ti,ab	12433
3	Medline	(1 OR 2)	44110
4	Medline	(chronic ADJ2 renal).ti,ab	34491
5	Medline	exp "RENAL INSUFFICIENCY, CHRONIC"/	96417
6	Medline	(4 OR 5)	111174
7	Medline	(3 AND 6)	3867
8	Medline	("risk factor*").ti,ab	452503
9	Medline	exp "RISK FACTORS"/ OR exp CAUSALITY/	681069
10	Medline	(8 OR 9)	909839
11	Medline	(7 AND 10)	658
12	Medline	(3 AND 5 AND 10)	513
13	Medline	(pregn*).ti	189454
14	Medline	exp PREGNANCY/	806485
15	Medline	(13 OR 14)	825376
16	Medline	(12 AND 15)	4
17	Medline	(preeclamps* OR "pre eclamps*").ti	11869
18	Medline	exp "PRE-ECLAMPSIA"/	26734
19	Medline	(17 OR 18)	28367

20	Medline	(6 AND 10 AND 19)	52
21	Medline	("kidney function" OR "renal function").ti,ab	82200
22	Medline	(11 AND 21)	208
23	Medline	(7 AND 15 AND 21)	11
24	Medline	*"ACUTE KIDNEY INJURY"/ OR *"KIDNEY TUBULAR NECROSIS, ACUTE"/	29441
25	Medline	*"RENAL INSUFFICIENCY, CHRONIC"/ OR *"KIDNEY FAILURE, CHRONIC"/	69153
26	Medline	(24 AND 25)	1405
27	Medline	(10 AND 26)	206
28	Medline	("long term").ti,ab	644024
29	Medline	exp "LONG TERM ADVERSE EFFECTS"/	148
30	Medline	(28 OR 29)	644086
31	Medline	(26 AND 30)	116
32	Medline	(27 OR 31)	265
33	Medline	(7 AND 29)	1
34	EMBASE	*"ACUTE KIDNEY FAILURE"/ OR *"ACUTE KIDNEY INJURY"/ OR *"ACUTE KIDNEY INSUFFICIENCY"/	28873
35	EMBASE	*"CHRONIC KIDNEY FAILURE"/ OR *"CHRONIC KIDNEY INJURY"/ OR *"CHRONIC KIDNEY INSUFFICIENCY"/	45491

36	EMBASE	(34 AND 35)	1122
37	EMBASE	exp "FOLLOW UP"/	1138130
39	EMBASE	("risk factor*").ti,ab	638239
40	EMBASE	exp "FOLLOW UP"/	1138130
41	EMBASE	exp "RISK FACTOR"/	793401
42	EMBASE	(37 OR 39 OR 40 OR 41)	2046035
43	EMBASE	(36 AND 42)	105
44	EMBASE	exp PREGNANCY/	656764
46	EMBASE	exp "ACUTE KIDNEY FAILURE"/	61883
47	EMBASE	exp "CHRONIC KIDNEY FAILURE"/	63756
48	EMBASE	(42 AND 46 AND 47)	536
49	EMBASE	(recovered OR resolved).ti,ab	322668
50	EMBASE	(48 AND 49)	29
51	EMBASE	exp "KIDNEY FUNCTION"/	155506
52	EMBASE	(36 AND 51)	156
53	EMBASE	(36 AND 49)	16
54	Medline	(reversible).ti,ab	125650
55	Medline	(7 AND 54)	103
56	Medline	(recovered OR resolved).ti,ab	277307
57	Medline	(7 AND 56)	115
58	EMBASE	exp "DISEASE COURSE"/	2617765

