AKI

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Sources Used
The following databases are searched on a regular basis in the development of this bulletin:
British Nursing index, Cinahl, Embase.

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Title: Valproic Acid Prevents Renal Dysfunction and Inflammation in the Ischemia-Reperfusion Injury Model.

Citation: BioMed Research International, 2016, vol./is. /(1-10), 23146133

Author(s): Costalonga, Elerson C., Silva, Filipe M. O., Noronha, Irene L.

Publication Type: Academic Journal

Source: CINAHL

Title: Acute Kidney Injury With Buffered Crystalloids vs Saline Among ICU Patients.

Citation: JAMA: Journal of the American Medical Association, 2016, vol./is. 315/14(1519-1521), 00987484

Publication Type: Academic Journal

Source: CINAHL

Title: Inhibitor of DNA Binding 1 Is Induced during Kidney Ischemia-Reperfusion and Is Critical for the Induction of Hypoxia-Inducible Factor-1α.

Citation: BioMed Research International, 2016, vol./is. /(1-10), 23146133

Author(s): Wen, Dan, Zou, Yan-Fang, Gao, Yao-Hui, Zhao, Qian, Xie, Yin-Yin, Shen, Ping-Yan, Xu, Yao-Wen, Xu, Jing, Chen, Yong-Xi, Feng, Xiao-Bei, Shi, Hao, Zhang, Wen

Publication Type: Academic Journal

Source: CINAHL

Title: WHAT’S NEW IN NEPHROLOGY. Acute kidney injury.

Citation: JAAPA: Journal of the American Academy of Physician Assistants, 2016, vol./is. 29/4(51-54), 15471896

Author(s): Lang, Joanna, Zuber, Kim, Davis, Jane

Publication Type: Academic Journal

Source: CINAHL

Title: Continuing Nursing Education. Contrast-Induced Acute Kidney Injury: Comparison of Preventative Therapies.

Citation: Nephrology Nursing Journal, 2016, vol./is. 43/2(109-117), 1526744X

Author(s): Honicker, Theresa

Publication Type: Academic Journal

Source: CINAHL

Title: The Importance of Preventing and Managing Sepsis Associated Acute Kidney Injury.

Citation: Nephrology Nursing Journal, 2016, vol./is. 43/2(164-), 1526744X

Author(s): Brown, Jami S.

Publication Type: Academic Journal

Source: CINAHL

Title: Association of Postoperative Hypoalbuminemia With Acute Kidney Injury Following Liver Transplantation.

Citation: Critical Care Medicine, 2016, vol./is. 44/1(0-1), 00903493
Author(s): Fu-Shan Xue, Gao-Pu Liu, Chao Sun, Xue, Fu-Shan, Liu, Gao-Pu, Sun, Chao

Abstract: A letter to the editor is presented in response to the article "Hypoalbuminemia Within Two Postoperative Days Is an Independent Risk Factor for Acute Kidney Injury Following Living Donor Liver Transplantation: A Propensity Score Analysis of 998 Consecutive Patients" published in the previous issue.

Publication Type: Academic Journal

Source: CINAHL

Title: Acute kidney injury following liver transplantation: A systematic review of published predictive models

Citation: Anaesthesia and Intensive Care, March 2016, vol./is. 44/2(251-261), 0310-057X;1448-0271 (March 2016)

Author(s): Caragata R., Wyssusek K.H., Kruger P.

Abstract: Acute kidney injury (AKI) is a frequent postoperative complication amongst liver transplant recipients and is associated with increased morbidity and mortality. This systematic review analysed the existing predictive models, in order to solidify current understanding. Articles were selected for inclusion if they described the primary development of a clinical prediction model (either an algorithm or risk score) to predict AKI post liver transplantation. The database search yielded a total of seven studies describing the primary development of a prediction model or risk score for the development of AKI following liver transplantation. The models span thirteen years of clinical research and highlight a gradual change in the definitions of AKI, emphasising the need to employ standardised definitions for subsequent studies. Collectively, the models identify a diverse range of predictive factors with several common trends. They emphasise the impact of preoperative renal dysfunction, liver disease severity and aetiology, metabolic risk factors as well as intraoperative variables including measures of haemodynamic instability and graft quality. Although several of the models address postoperative parameters, their utility in predictive modelling seems to be of questionable relevance. The common risk factors identified within this systematic review provide a minimum list of variables, which future studies should address. Research in this area would benefit from prospective, multisite studies with larger cohorts as well as the subsequent internal and external validation of predictive models. Ultimately, the ability to identify patients at high risk of post-transplant AKI may enable early intervention and perhaps prevention.

Publication Type: Journal: Review

Source: EMBASE

Title: Clinical characteristics and 30-day outcomes of intermittent hemodialysis for acute kidney injury in an african intensive care unit

Citation: BioMed Research International, 2016, vol./is. 2016/(no pagination), 2314-6133;2314-6141 (2016)


Abstract: Introduction. Acute kidney injury (AKI) is a common occurrence in the intensive care unit (ICU). Studies have looked at outcomes of renal replacement therapy using intermittent haemodialysis (IHD) in ICUs with varying results. Little is known about the outcomes of using IHD in resource-limited settings where continuous renal replacement therapy (CRRT) is limited. We sought to determine outcomes of IHD among critically ill patients admitted to a low-income country ICU. Methods. A retrospective review of patient records was conducted. Patients admitted to the ICU who underwent IHD for AKI were included in the study. Patients’ demographic and clinical characteristics, cause of AKI, laboratory parameters, haemodialysis characteristics, and survival were interpreted and analyzed. Primary outcome was mortality. Results. Of 62 patients, 40 had complete records. Median age of patients was 38.5 years. Etiologic diagnoses associated with AKI included sepsis, malaria, and ARDS. Mortality was 52.5%, APACHE II (OR 4.550; 95% CI 1.2-17.5, p = 0.028), mechanical ventilation (OR 13.063; 95% CI 2.3-72, p = 0.003), and need for vasopressors (OR 16.8; 95% CI 3.4-82.6, p = 0.001) had statistically significant association with mortality. Conclusion. IHD may be a feasible alternative for RRT in critically ill haemodynamically stable patients in low resource settings where CRRT may not be available.

Publication Type: Journal: Article

Source: EMBASE

Title: Nonapnea sleep disorders and the risk of acute kidney injury: A nationwide population-based study

Citation: Medicine (United States), 2016, vol./is. 95/11(no pagination), 0025-7974;1536-5964 (2016)
Title: Nonapnea sleep disorders (NASDs) and associated problems, which are highly prevalent in patients with kidney diseases, are associated with unfavorable medical sequelae. Nonetheless, whether NASDs are associated with acute kidney injury (AKI) development has not been thoroughly analyzed. We examined the association between NASD and AKI. We conducted a population-based study by using 1,000,000 representative data from the Taiwan National Health Insurance Research Database for the period from January 1, 2000, to December 31, 2010. We studied the incidence and risk of AKI in 9178 newly diagnosed NASD patients compared with 27,534 people without NASD matched according to age, sex, index year, urbanization level, region of residence, and monthly income at a 1:3 ratio. The NASD cohort had an adjusted hazard ratio (hazard ratio [HR]; 95% confidence interval [CI]=1.15-2.63) of subsequent AKI 1.74-fold higher than that of the control cohort. Older age and type 2 diabetes mellitus were significantly associated with an increased risk of AKI (P<0.05). Among different types of NASDs, patients with insomnia had a 120% increased risk of developing AKI (95% CI=1.38-3.51; P=0.001), whereas patients with other sleep disorders had a 127% increased risk of subsequent AKI (95% CI=1.07-4.80; P=0.033). Men with NASDs were at a high risk of AKI (P<0.05). This nationwide population-based cohort study provides evidence that patients with NASDs are at higher risk of developing AKI than people without NASDs.

Title: Could blood neutrophil gelatinase-associated lipocalin (NGAL) be a diagnostic marker for acute kidney injury in neonates? A systematic review and meta-analysis


Abstract: Blood neutrophil gelatinase-associated lipocalin (NGAL) has been shown to be helpful for acute kidney injury (AKI) in pediatric patients and adults. Whether this is true in neonates remains unclear. Methods: A systematic review and diagnostic meta-analysis was performed. Keywords included blood NGAL/serum NGAL, neonate/newborn, and AKI/acute kidney failure. Eligible studies measured blood or serum NGAL levels in neonates with AKI (first 30 days of life). Studies were excluded if they did not present sufficient data to extract or calculate true positives, false positives, false negatives, and true negatives, or were not available in English. Results: Five of 50 studies were included with 159 critically ill neonates and 251 measurements of blood NGAL concentrations. The overall pooled positive and negative likelihood ratios were 5.84 (95% CI 2.68-12.75) and 0.23 (95% CI 0.14-0.38). The area under the receiver operating characteristic curve was 0.87 and the Q value was 0.823. The overall pooled sensitivity and specificity of all studies were 0.813 (95% CI: 0.697-0.891) and 0.859 (95% CI: 0.730-0.932). The pooled diagnostic odds ratio was 27.20 (95% CI 8.84-83.74), with Cochran’s Q = 4.07 (p = 0.397). No publication bias was found. Conclusions: Blood NGAL could be used as diagnostic marker for AKI in neonates. Acknowledgement: This study was supported by the National Nature Science Foundation of China (81400718) and Beijing Friendship Hospital Research Fund.
Source: EMBASE

Title: Prognostic Usefulness of Acute Kidney Injury after Transcatheter Aortic Valve Replacement

Citation: American Journal of Cardiology, April 2016, vol./is. 117/8(1327-1331), 0002-9149;1879-1913 (15 Apr 2016)


Abstract: Acute kidney injury (AKI) after transcatheter aortic valve replacement (TAVR) has been associated with increased postoperative morbidity and mortality. Long-term outcomes after TAVR with the Edwards SAPIEN valve in patients who develop AKI postoperatively are currently not well described. We retrospectively reviewed 384 consecutive patients undergoing TAVR at 2 institutions from August 2006 to April 2012. AKI was defined and staged according to Valve Academic Research Consortium-2 criteria. The incidence, multivariate predictors, and association of AKI with 3-year mortality were evaluated. Stage 1 AKI occurred in 24.0% of patients (92 of 384), stage 2 in 5.5% (21 of 384), and stage 3 in 8.1% (31 of 384). The overall operative mortality rate was 7.6%, with a mortality of 3.0% in patients with no kidney injury, 7.6% in stage 1, 23.8% in stage 2, and 32.3% in stage 3. The incidence of new postoperative dialysis was 3.1%. Survival at 3 years for no-AKI/stage 1/stage 2/stage 3 was 59.2 ± 3.3%, 43.4 ± 5.2%, 27.8 ± 10.0%, and 25.4 ± 7.9%, respectively. Logistic regression modeling for the combination of stage 2 or 3 AKI after surgery demonstrated that the last preoperative creatinine (for each 1 mg/dl increase, odds ratio = 3.23, 95% CI 1.83 to 5.69; p <0.001) and dye load (for each 10 ml increase, odds ratio = 1.04, 95% CI 1.01 to 1.08; p = 0.006) were significant predictors for AKI. In conclusion, AKI after TAVR is associated with increased postoperative and 3-year mortality. Significant multivariate predictors are potentially modifiable before the procedure.

Publication Type: Journal: Article

Source: EMBASE

Title: The value of serum creatine kinase in predicting the risk of rhabdomyolysis-induced acute kidney injury: a systematic review and meta-analysis

Citation: Clinical and Experimental Nephrology, April 2016, vol./is. 20/2(153-161), 1342-1751;1437-7799 (01 Apr 2016)

Author(s): Safari S., Yousefifard M., Hashemi B., Baratloo A., Forouzanfar M.M., Rahmati F., Motamedi M., Najafi I.

Abstract: Introduction: Identifying the potential effective factors of rhabdomyolysis-induced acute kidney injury (AKI) is of major importance for both treatment and logistic concerns. The present study aimed to evaluate the value of creatine kinase (CK) in predicting the risk of rhabdomyolysis-induced AKI through meta-analysis. Methods: Two reviewers searched the electronic databases of Medline, EMBASE, Cochrane library, Scopus, and Google Scholar. Data regarding study design, patient characteristics, number of cases, mean and screening characteristics of CK, and final patient outcome were extracted from relevant studies. Pooled measures of standardized mean difference, OR, and diagnostic accuracy were calculated using STATA version 11.0. Result: 5997 non-redundant studies were found (143 potentially relevant). 27 articles met the inclusion criteria but 9 were excluded due to lack of data. The correlation between serum CK and AKI occurrence was stronger in traumatic cases (SMD = 1.34, 95 % CI = 1.25-1.42, I<sup>2</sup> = 94 %; p < 0.001). This correlation was more prominent in crush-induced AKI (adjusted OR = 14.7, 95 % CI = 7.63-28.52, I<sup>2</sup> = 0.0 %; p = 0.001). Area under the ROC curve of CK in predicting AKI occurrence was 0.75 (95 % CI = 0.71-0.79). Conclusion: The results of this meta-analysis declared the significant role of rhabdomyolysis etiology (traumatic/non-traumatic) in predictive performance of CK. There was a significant correlation between mean CK level and risk of crush-induced AKI. The pooled OR of CK was considerable, but its screening performance characteristics were not desirable.

Publication Type: Journal: Review

Source: EMBASE

Title: Serum uric acid level as a risk factor for acute kidney injury in hospitalized patients: a retrospective database analysis using the integrated medical information system at Kochi Medical School hospital

Citation: Clinical and Experimental Nephrology, April 2016, vol./is. 20/2(235-243), 1342-1751;1437-7799 (01 Apr 2016)
glomerular filtration rate (eGFR) were shown to predict adverse outcomes, but, when considered together, their noncardiovascular complications. In separate studies, acute kidney injury (AKI), albuminuria, and low est diabetes mellitus.

Abstract: Background and objectives: Recent studies have shown that both low and high levels of serum uric acid (SUA) before cardiovascular surgery are independent risk factors for postoperative acute kidney injury (AKI). However, these studies were limited by their small sample sizes. Here, we investigated the association between SUA levels and AKI by performing a retrospective database analysis of almost 30 years of data from 81,770 hospitalized patients. Design, setting, participants, and measurement: Hospitalized patients aged >18 years were retrospectively enrolled. AKI was diagnosed according to the Kidney Disease: Improving Global Outcomes 2012 Clinical Practice Guideline (KDIGO) criteria. Multivariate logistic regression analyses were performed to investigate the independent association between SUA levels and the incidence of AKI. SUA levels were treated as categorical variables because the relationship between SUA and the incidence of AKI has been suggested to be J-shaped or U-shaped. In addition to stratified SUA levels, we considered kidney function and related comorbidities, medications, and procedures performed prior to AKI onset as possible confounding risk factors. Results: The final study cohort included 59,219 adult patients. Adjusted odds ratios of AKI incidence were higher in both the high- and low-SUA strata. Odds ratios tended to become larger in the higher range of SUA levels in women than in men. Additionally, this study showed that AKI risk was elevated in patients with SUA levels <7 mg/dL. An SUA level >7 mg/dL is considered the point of initiation of uric acid crystallization. Conclusions: SUA level could be an independent risk factor for AKI development in hospitalized patients. Additionally, our results might suggest that intervention to lower SUA levels is necessary, even in cases of moderate elevation that does not warrant hyperuricemia treatment. Results also showed that SUA levels that require attention are lower for women than for men.

Publication Type: Journal: Article
Source: EMBASE

Title: Green Tea Polyphenol Prevents Diabetic Rats from Acute Kidney Injury after Cardiopulmonary Bypass Presented at the American Heart Association Scientific Session, Chicago, IL, Nov 15-19, 2014

Citation: Annals of Thoracic Surgery, April 2016, vol./is. 101/4(1507-1513), 0003-4975;1552-6259 (01 Apr 2016)

Author(s): Funamoto M., Masumoto H., Takaori K., Taki T., Setozaki S., Yamazaki K., Minakata K., Ikeda T., Hyon S.-H., Sakata R.

Abstract: Background: Acute kidney injury (AKI) is a common complication accompanying cardiopulmonary bypass (CPB) and is independently associated with increased morbidity and death. Diabetes mellitus increases the risk for AKI after CPB. Epigallocatechin-3-gallate (EGCG) is a major component of the polyphenolic fraction of green tea, which possesses cardioprotective activities, as previously reported. We hypothesized that EGCG also possesses a renoprotective effect through its diverse biochemical properties and assessed the effect on renal function after CPB for diabetic rats. Methods: Goto-Kakizaki rats developing type 2 diabetes mellitus were randomly assigned to one of the following groups: sham (n = 10), CPB (CPB alone, n = 9), or EGCG (CPB + EGCG, n = 10). CPB was conducted for 30 minutes at a flow rate of 100 mL/kg/min in the CPB and EGCG groups. Rats assigned to the EGCG group were administrated EGCG solution orally for 2 weeks before CPB. We evaluated renal biochemical or histologic changes at 24 hours after CPB. Results: Compared with the CPB group, the EGCG group exhibited milder tubular injury histologically (p < 0.0001) and reduced expression of kidney injury molecule-1, a biomarker for renal tubular injury (p < 0.0001) and 8-hydroxy-2′-deoxyguanosine (p < 0.01), indicating attenuated oxidant stress. Conclusions: Preoperative oral administration of EGCG ameliorates AKI in a CPB model of diabetic rats through antioxidative properties. This simple method could be applied in a clinical setting as a prophylactic renal protection against AKI after CPB, especially for high-risk patients with diabetes mellitus.

Publication Type: Journal: Article
Source: EMBASE

Title: Acute kidney injury predicts major adverse outcomes in diabetes: Synergic impact with low glomerular filtration rate and albuminuria

Citation: Diabetes Care, December 2015, vol./is. 38/12(2333-2340), 0149-5992;1935-5548 (December 2015)


Abstract: OBJECTIVE: Subjects with diabetes are prone to the development of cardiovascular and noncardiovascular complications. In separate studies, acute kidney injury (AKI), albuminuria, and low estimated glomerular filtration rate (eGFR) were shown to predict adverse outcomes, but, when considered together, their
respective prognostic value is unknown. RESEARCH DESIGN AND METHODS Patients with type 2 diabetes consecutively recruited in the SURDIAGEN cohort were prospectively followed up for major diabetes-related events, as adjudicated by an independent committee: death (with cause), major cardiovascular events (myocardial infarction, stroke, congestive heart failure, amputation, and arterial revascularization), and renal failure (i.e., sustained doubling of serum creatinine level or end-stage renal disease). RESULTS Intra-hospital AKI occurred in 411 of 1,371 patients during the median follow-up period of 69 months. In multivariate analyses, AKI was significantly associated with cardiovascular and noncardiovascular death, including cancer-related death. In multivariate analyses, AKI was a powerful predictor of major adverse cardiovascular events, heart failure requiring hospitalization, myocardial infarction, stroke, lower-limb amputation or revascularization, and carotid artery revascularization. AKI, EGFR, and albuminuria, even when simultaneously considered in multivariate models, predicted all-cause and cardiovascular deaths. All three renal biomarkers were also prognostic of most adverse outcomes and of the risk of renal failure. CONCLUSIONS AKI, low EGFR, and elevated albuminuria, separately or together, are compelling biomarkers of major adverse outcomes and death in diabetes.

Publication Type: Journal: Article
Source: EMBASE
Title: Synthetic cannabinoid hyperemesis resulting in rhabdomyolysis and acute renal failure
Citation: American Journal of Emergency Medicine, April 2016, vol./is. 34/4(765.e1-765.e2), 0735-6757;1532-8171 (01 Apr 2016)
Author(s): Argamany J.R., Reveles K.R., Duhon B.

Publication Type: Journal: Short Survey
Source: EMBASE
Title: Autophagy limits endotoxemic acute kidney injury and alters renal tubular epithelial cell cytokine expression
Citation: PLoS ONE, March 2016, vol./is. 11/3(no pagination), 1932-6203 (March 2016)
Author(s): Leventhal J.S., Ni J., Osmond M., Lee K., Gusella G.L., Salem F., Ross M.J.
Abstract: Sepsis related acute kidney injury (AKI) is a common in-hospital complication with a dismal prognosis. Our incomplete understanding of disease pathogenesis has prevented the identification of hypothesis-driven preventive or therapeutic interventions. Increasing evidence in ischemia-reperfusion and nephrotoxic mouse models of AKI support the theory that autophagy protects renal tubular epithelial cells (RTEC) from injury. However, the role of RTEC autophagy in septic AKI remains unclear. We observed that lipopolysaccharide (LPS), a mediator of gram-negative bacterial sepsis, induces RTEC autophagy in vivo and in vitro through TLR4-initiated signaling. We modeled septic AKI through intraperitoneal LPS injection in mice in which autophagy-related protein 7 was specifically knocked out in the renal proximal tubules (ATG7KO). Compared to control littermates, ATG7KO mice developed more severe renal dysfunction (24hrBUN 100.1mg/dl +/- 14.8vs54.6mg/dl +/- 11.3) and parenchymal injury. After injection with LPS, analysis of kidney lysates identified higher IL-6 expression and increased STAT3 activation in kidney lysates from ATG7KO mice compared to controls. In vitro experiments confirmed an altered response to LPS in RTEC with genetic or pharmacological impairment of autophagy. In conclusion, RTEC autophagy protects against endotoxin induced injury and regulates downstream effects of RTEC TLR4 signaling.

Publication Type: Journal: Article
Source: EMBASE
Title: Phytochemical, pharmacological evaluation of Sapindus emarginatus Vahl. bark extract for nephroprotective activity
Citation: International Journal of Pharmaceutical Sciences and Research, 2016, vol./is. 7/4(1564-1571), 2320-5148;0975-8232 (2016)
Author(s): Jedage H.D., Manjunath K.P.
Abstract: Gentamicin causes kidney cellular damage by alterations in biological functions. This study evaluated the nephroprotective potential of the ethanolic extract and its fraction originating from Sapindus emarginatus Vahl. (Sapindaceae) bark against the Gentamicin-induced nephrotoxicity in rat. Objective: To evaluate the nephroprotective effect of ethanolic extract and its organic solvent fraction of S. emarginatus Vahl. in gentamicin-induced acute renal failure in rats. Materials and Methods: Nephrotoxicity was induced in wistar rats by
intraperitoneal administration of gentamicin 100 mg/kg/day for ten days. The treatment was done with silymarin 50 mg/kg, ethanol extract 200 mg/kg/p.o. and its ethyl acetate fractions 100 mg/kg/p.o. bark of S. emarginatus was determined using parameters serum creatinine, urea, uric acid, blood urea nitrogen, albumin, protein, other parameters are kidney weight, body weight, urine volume and histopathology of kidney. Results: It was observed that the ethanol extract and its ethyl acetate fractions bark of S. emarginatus has brought back the altered levels of biochemical markers to the near normal levels in the dose dependent manner. In histopathological study the gentamicin-induced glomerular congestion, peritubular inflammation, tubular desquamation, tubular congestion, interstitial haemorrhage and oedema of the kidney cells were found to be reduced in the group receiving the bark extracts of S. emarginatus along with gentamicin. Conclusion: The present study that ethanol and its ethyl acetate fraction possessed nephroprotective activity. The isolated fraction was found to exhibit greater nephroprotective activity than the ethanol extract.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Long-term outcome of severe acute kidney injury survivors followed by nephrologists in a developing country

**Citation:** Nephrology, April 2016, vol./is. 21/4(327-334), 1320-5358;1440-1797 (01 Apr 2016)

**Author(s):** Ponce D., Dias D.B., Nascimento G.R., Silveira L.V.D.A., Balbi A.L.

**Abstract:** Aim This study aimed to evaluate the long-term outcome of patients after a severe episode of acute kidney injury (AKI) on survival and progression to chronic kidney disease (CKD) and to identify risk factors associated with these outcomes. Methods We performed a prospective study that evaluated the long-term outcome of 509 AKI stage 3 patients who were followed by nephrologists in a Brazilian University Hospital from 2004 to 2013. Results Age was 60.2 years (47.5-71) and the follow-up time was 25 months (12-44). The late mortality was 38.1% and age (HR 2.89, 95%CI=1.88 to 4.46, P < 0.0001), diabetes (HR 1.46, 95%CI=1.02 to 2.16, P < 0.047), liver disease (HR 2.95, 95%CI=1.19 to 7.3, P = 0.02) and creatinine (Cr) at the time of hospital discharge (HR 1.21, 95%CI=1.04 to 1.41, P = 0.01) were associated with poor long-term survival. At the moment of hospital discharge, 52.1% of patients had complete recovery of renal function, 39.7% had partial recovery and 8.3% had not recovered renal function. After 36 months, 43.5% of patients progressed to CKD, and 5.3% needed for chronic dialysis. Factors associated with progression to CKD were age (HR 1.02, 95%CI=1.008 to 1.035, P = 0.009), CKD (HR 1.05 95% CI=1.01-1.09, P = 0.04), diabetes (HR 1.12, CI 1.008-1.035, P = 0.009) and number of AKI episodes (HR 1.65, 95%CI=1.19 to 2.2, P = 0.0023). Conclusion This study showed that AKI patients have high mortality after hospital discharge and age, diabetes, liver disease, and Cr value at the time of discharge were factors associated with long-term mortality. The risk factors for this progression to CKD were age, the presence of diabetes and the number of AKI episodes.

**Publication Type:** Journal: Review

**Source:** EMBASE

**Title:** Remote ischaemic preconditioning for the prevention of acute kidney injury

**Citation:** Nephrology, April 2016, vol./is. 21/4(274-285), 1320-5358;1440-1797 (01 Apr 2016)

**Author(s):** Ho P.W.-L., Pang W.-F., Szeto C.-C.

**Abstract:** Acute kidney injury (AKI) is a common complication associated with high morbidity and mortality in hospitalized patients. One potential mechanism underlying renal injury is ischaemia/reperfusion injury (IRI), which attributed the organ damage to the inflammatory and oxidative stress responses induced by a period of renal ischaemia and subsequent reperfusion. Therapeutic strategies that aim at minimizing the effect of IRI on the kidneys may prevent AKI and improve clinical outcomes significantly. In this review, we examine the technique of remote ischaemic preconditioning (rIPC), which has been shown by several trials to confer organ protection by applying transient, brief episodes of ischaemia at a distant site before a larger ischaemic insult. We provide an overview of the current clinical evidence regarding the renoprotective effect of rIPC in the key clinical settings of cardiac or vascular surgery, contrast-induced AKI, pre-existing chronic kidney disease (CKD) and renal transplantation, and discuss key areas for future research.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Angiopoietin-2 is an early indicator of acute pancreatic-renal syndrome in patients with acute pancreatitis
Abstract: Within the first week of the disease, acute kidney injury (AKI) is among the most common causes of mortality in acute pancreatitis (AP). Recently, serum angiotensin-2 (Ang-2) has been associated with hyperdynamic state of the systemic circulation. The aim of this study was to examine the associations between Ang-2 and the clinical AP severity during the first 72 hours of the disease, and organ dysfunction, including AKI. Methods. Study included patients admitted to the surgery ward, diagnosed with AP. AKI was diagnosed according to KDIGO guidelines and renal failure according to modified Marshall scoring system. Ang-2 was determined in serum with ELISA. Results. AP was classified as mild (MAP) in 71% of patients, moderately severe (MSAP) in 22%, and severe (SAP) in 8%. During the first 72 hours of AP, 11 patients developed AKI and 6 developed renal failure. Ang-2 at 24, 48, and 72 hours following the onset of AP symptoms significantly predicted SAP and MSAP, as well as AKI and renal failure. Also, Ang-2 significantly correlated with acute phase proteins as well as with the indicators of renal dysfunction. Conclusions. Serum Ang-2 may be a relevant predictor of AP severity, in particular of the development of AP-renal syndrome.

Title: Short-term preconditioning enhances the therapeutic potential of adipose-derived stromal/stem cell-conditioned medium in cisplatin-induced acute kidney injury

Citation: Experimental Cell Research, March 2016, vol./is. 342/2(175-183), 0014-4827;1090-2422 (15 Mar 2016)

Abstract: The development of new strategies to preserve renal function after acute kidney injury (AKI) is necessary due to limited clinical intervention options. The organ-protective effects of mesenchymal stromal/stem cells (MSCs) and their conditioned medium (CM) have been investigated demonstrating that both separately promoted tubular recovery and ameliorated the outcome of AKI. Nevertheless, strategies to optimise the regenerative potential of both are highly needed. Here we investigated the effects of CM from adipose-derived MSCs (ASCs) preincubated in a hypoxic environment (Hyp). Protective factors were investigated by PCR analysis and a protein array in vitro. The expression of 64 of the 308 proteins assayed was found to be more than two-fold increased after Hyp. CM of Hyp-pretreated ASCs (pCM) was used to enhance regeneration in a mouse model of cisplatin-induced AKI (cisAKI). Renal function was assessed by measurements of markers for AKI and serum cytokine levels. The pCM significantly ameliorated serum creatinine and neutrophil gelatinase-associated lipocalin values, and also the levels of inflammatory cytokines IL-1beta and IL-6 in the serum of mice with AKI. Our work clearly showed that a Hyp preconditioning significantly increases the release of protective factors in ASCs and enhances the therapeutic effects of CM in cisAKI in mice.

Title: The epidemiology of hospitalised acute kidney injury not requiring dialysis in England from 1998 to 2013: Retrospective analysis of hospital episode statistics

Citation: International Journal of Clinical Practice, April 2016, vol./is. 70/4(330-339), 1368-5031;1742-1241 (01 Apr 2016)

Abstract: Summary Aims Epidemiology studies of acute kidney injury (AKI) have focused on cases requiring dialysis but those not requiring dialysis represent the majority. To address this gap, we interrogated hospital episode statistics (HES) to investigate population trends in temporal epidemiology of AKI not requiring dialysis between 1998 and 2013. Methodology In this retrospective observational study of HES data covering the entire English National Health Service, we identified 1,136,167 AKI events, not requiring dialysis, diagnosed between 1998 and 2013. We explored the effect of age, gender, ethnicity, Charlson's comorbidity score (CCS), method of admission, diagnosis period and AKI in diagnosis codes on temporal changes in the incidence and case-fatality of AKI with specific examination of its predictors. Result The incidence of AKI increased from 15,463 cases (317 pmp) in 1998-1999 to 213,700 cases (3995 pmp) in 2012-2013. There was increase in proportion of people over 75 years from 51.1% in 1998-1999 to 63.4% in 2012-2013. Overall unadjusted case-fatality decreased from 42.3% in 1998-2003 to 27.1% in 2008-2013, p < 0.001. Compared with 1998-2003, the multivariable adjusted odds ratio for death was 0.64 in 2003-2008 (95% CI 0.63-0.65) and 0.35 in 2008-2013 (95% CI 0.34-0.35). Odds
for death were higher for patients over 85 years (2.93; 95% CI 2.89-2.97), CCS of more than five (2.75; 95% CI 2.71-2.79), emergency admissions (2.14; 95% CI 2.09-2.18) and AKI in the secondary diagnosis code (1.35; 95% CI 1.33-1.36) and AKI in other diagnoses codes (2.17; 95% CI 2.15-2.20). Conclusions In England, the incidence of AKI not requiring dialysis has increased and case-fatality has decreased over last 15 years. Efforts to reduce the incidence of AKI and improve survival should focus on elderly people, emergency admissions and those with multi-morbidity.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Bardet-biedl syndrome with vulva carcinoma presented with acute renal failure: A case report

**Citation:** Hippokratia, 2015, vol./is. 19/2(176-178), 1108-4189;1790-8019 (2015)

**Author(s):** Sari F., Sarikaya A.M., Suren D., Eren M., Yilmaz B.

**Abstract:** Background: Bardet-Biedl syndrome is a rare disorder characterized by retinal dystrophy, obesity, kidney dysfunction, polydactyly, hypogonadism and cognitive impairment. It can be accompanied by systemic findings such as malignancy, hypertension, diabetes mellitus, constitutional and functional disorders of urogenital system and liver fibrosis. Case report: A 35-year-old woman with Bardet-Biedl syndrome was referred to our outpatient nephrology clinic with dysuria, acute renal failure, and urinary tract infection. A sized 2 x 1 cm mass between labia major and minor was noted, while CT scan showed a lesion that encompassed uterus and extended to the posterior side of the bladder in the left adnexal region and a 3 cm lesion in the liver. Excisional biopsy of the mass revealed a well-differentiated, squamous cell carcinoma. Dysuria resolved with insertion of urinary catheter after bougie dilatation and the patient was referred for radiotherapy. Conclusion: It should be kept in the mind that renal failure may develop due to constitutional urogenital anomalies such as vulva carcinoma. This can be an important cause of morbidity and mortality in patients with Bardet-Biedl syndrome.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** National trends of acute kidney injury requiring dialysis in decompensated cirrhosis hospitalizations in the United States

**Citation:** Hepatology International, May 2016, vol./is. 10/3(525-531), 1936-0533;1936-0541 (01 May 2016)

**Author(s):** Nadkarni G.N., Simoes P.K., Patel A., Patel S., Yacoub R., Konstantinidis I., Kamat S., Annapureddy N., Panik C.R., Coca S.G.

**Abstract:** Background and aims: Cirrhosis affects 5.5 million patients with estimated costs of US$4 billion. Previous studies about dialysis requiring acute kidney injury (AKI-D) in decompensated cirrhosis (DC) are from a single center/year. We aimed to describe national trends of incidence and impact of AKI-D in DC hospitalizations. Methods: We extracted our cohort from the Nationwide Inpatient Sample (NIS) from 2006-2012. We identified hospitalizations with DC and AKI-D by validated ICD9 codes. We analyzed temporal changes in DC hospitalizations complicated by AKI-D and utilized multivariable logistic regression models to estimate AKI-D impact on hospital mortality. Results: We identified a total of 3,655,700 adult DC hospitalizations from 2006 to 2012 of which 78,015 (2.1 %) had AKI-D. The proportion with AKI-D increased from 1.5 % in 2006 to 2.23 % in 2012; it was stable between 2009 and 2012 despite an increase in absolute numbers from 6773 to 13,930. The overall hospital mortality was significantly higher in hospitalizations with AKI-D versus those without (40.87 vs. 6.96 %, p < 0.001). In an adjusted multivariable analysis, adjusted odds ratio for mortality was 2.17 (95 % CI 2.06-2.28, p < 0.01) with AKI-D, which was stable from 2006 to 2012. Changes in demographics and increases in acute/chronic comorbidities and procedures explained temporal changes in AKI-D. Conclusions: Proportion of DC hospitalizations with AKI-D increased from 2006 to 2009, and although this was stable from 2009 to 2012, there was an increase in absolute cases. These results elucidate the burden of AKI-D on DC hospitalizations and excess associated mortality, as well as highlight the importance of prevention, early diagnosis and testing of novel interventions in this vulnerable population.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Links between coagulation, inflammation, regeneration, and fibrosis in kidney pathology

**Citation:** Laboratory Investigation, April 2016, vol./is. 96/4(378-390), 0023-6837;1530-0307 (01 Apr 2016)
Author(s): Suarez-Alvarez B., Liapis H., Anders H.-J.

Abstract: Acute kidney injury (AKI) involves nephron injury leading to irreversible nephron loss, i.e., chronic kidney disease (CKD). Both AKI and CKD are associated with distinct histological patterns of tissue injury, but kidney atrophy in CKD involves tissue remodeling with interstitial inflammation and scarring. No doubt, nephron atrophy, inflammation, fibrosis, and renal dysfunction are associated with each other, but their hierarchical relationships remain speculative. To better understand the pathophysiology, we provide an overview of the fundamental danger response programs that assure host survival upon traumatic injury from as early as the first multicellular organisms, i.e., bleeding control by coagulation, infection control by inflammation, epithelial barrier restoration by re-epithelialization, and tissue stabilization by mesenchymal repair. Although these processes assure survival in the majority of the populations, their dysregulation causes kidney disease in a minority. We discuss how, in genetically heterogeneous population, genetic variants shift balances and modulate danger responses toward kidney disease. We further discuss how classic kidney disease entities develop from an insufficient or overshooting activation of these danger response programs. Finally, we discuss molecular pathways linking, for example, inflammation and regeneration or inflammation and fibrosis. Understanding the causative and hierarchical relationships and the molecular links between the danger response programs should help to identify molecular targets to modulate kidney injury and to improve outcomes for kidney disease patients.

Publication Type: Journal: Review

Source: EMBASE

Title: No increased risk of acute kidney injury after a single dose of gentamicin in patients with sepsis

Citation: Infectious Diseases, 2016, vol./is. 48/4(274-280), 2374-4235 (2016)

Author(s): Cobussen M., De Kort J.M.L., Dennert R.M., Lowe S.H., Stassen P.M.

Abstract: Background Aminoglycosides are frequently used in the empirical treatment of sepsis. However, aminoglycosides may induce acute kidney injury (AKI). Data is lacking on the renal safety of a single dose of aminoglycosides in septic patients visiting the emergency department (ED). Aim To investigate the incidence of AKI in septic patients after a single dose of gentamicin (5 mg/kg) and to evaluate possible risk factors. Methods This study retrospectively followed patients, aged >18 years, visiting the ED and fulfilling sepsis criteria for 1 year. Two groups were analysed: septic patients receiving gentamicin in combination with beta-lactam antibiotics and a control group with pneumosepsis patients only without gentamicin. Renal function was determined prior to admission, at presentation and during the following 2 weeks. AKI was defined according to the RIFLE criteria. Results In total, 302 patients were included, 179 in the gentamicin and 123 in the control group. Mean gentamicin dose was 4.7 +/- 0.7 mg/kg. At admission, 26.8% of the gentamicin and 16.3% of the control group had AKI. After admission, AKI occurred in 6.7% of the gentamicin and in 3.3% of the control group (p=0.30). Occurrence of AKI was not associated with gentamicin administration, but with septic shock (31.2% in patients with AKI vs 9.8% without AKI after admission, p=0.02). Conclusion This study showed no increased risk of AKI after a single dose of gentamicin to patients with sepsis in the ED, suggesting that a single dose of gentamicin can, with regard to renal function, be safely administered to septic patients.

Publication Type: Journal: Article

Source: EMBASE

Title: Acute kidney injury and pneumothorax are risk factors for mortality in persistent pulmonary hypertension of the newborn in Thai neonates

Citation: Journal of Maternal-Fetal and Neonatal Medicine, June 2016, vol./is. 29/11(1741-1746), 1476-7058;1476-4954 (02 Jun 2016)

Author(s): Nakwan N., Pithaklimnuwong S.

Abstract: Objectives: To describe the clinical characteristics, diagnostic methods, treatment modalities, and complications, and identify the mortality risk factors, of infants with short-term persistent pulmonary hypertension of the newborn (PPHN). Methods: The clinical data of infants diagnosed with PPHN at Hat Yai Hospital from January 2010 to February 2014 were retrospectively reviewed. Cox proportional hazard regression analysis was performed to assess factors associated with mortality. Results: The records of 119 infants were analyzed. Of these, 47 died giving an in-hospital mortality rate of 39.5%. The prevalence of PPHN (based on inborn births) was 2.8 per 1000 live births. The mean gestational age and birth weight were 39.1 +/- 1.6 weeks and 3044 +/- 563 g, respectively. Multivariate Cox regression analysis indicated that pneumothorax [adjusted hazard ratio (HR) = 2.07 (95% CI 1.09-3.93)] and acute kidney injury [adjusted HR = 2.99 (95% CI 1.59-5.61)] were factors associated independently with an increased risk for death, while infants who received total parenteral nutrition [adjusted HR = 0.22 (95% CI 0.10-0.50)] had lower mortality. Conclusion: A high mortality rate of PPHN was
observed in this study. Significantly higher mortality was noted in infants complicated with pneumothorax and acute kidney injury.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Colistin-associated Acute Kidney Injury in Severely Ill Patients: A Step Toward a Better Renal Care? A Prospective Cohort Study

**Citation:** Clinical Infectious Diseases, December 2015, vol./is. 61/12(1771-1777), 1058-4838;1537-6591 (15 Dec 2015)

**Author(s):** Dalfino L., Puntillo F., Ondok M.J.M., Mosca A., Monno R., Coppolecchia S., Spada M.L., Bruno F., Brienza N.

**Abstract:** Background. Critically ill patients with severe sepsis or septic shock may need relatively high colistin daily doses for efficacy against multidrug-resistant and extensively drug-resistant gram-negative rods. However, acute kidney injury (AKI) may represent a major dose-limiting adverse effect of colistin. We sought to determine AKI occurrence and to identify factors influencing AKI risk in severely ill patients receiving colistin according to a recently proposed dosing strategy. Methods. A prospective, observational, cohort study involving patients with severe sepsis or septic shock who received colistin was performed. AKI was defined according to Acute Kidney Injury Network criteria. Colistin administration was driven by a modified pharmacokinetics-pharmacodynamics (PK/PD)-based dosing approach. Results. Of 70 patients who received colistin at a median daily dose of 9 million IU (MIU; interquartile range, 5.87-11.1 MIU), 31 (44%) developed AKI. In univariate analysis, age, Acute Physiology and Chronic Health Evaluation (APACHE) II score, Sequential Organ Failure Assessment (SOFA), score and baseline renal impairment were significantly associated with AKI. Moreover, patients with AKI were less frequently treated with adjuvant ascorbic acid (P =. 003). In multivariate analysis, independent predictors of AKI were baseline renal impairment (adjusted hazard ratio, 4.15; 95% confidence interval, 1.9-9.2; P <. 001) and age (1.03; 1.0-1.05; P =. 028), whereas a strong independent renal-protective role emerged for ascorbic acid (0.27; 0.12-0.57; P <. 001). Conclusions. In severely ill patients receiving colistin according to a PK/PD-driven dosing approach, baseline renal impairment and older age strongly predict AKI occurrence, but concomitant administration of ascorbic acid markedly reduces AKI risk, allowing safer use of colistin.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Postoperative blood pressure deficit and acute kidney injury progression in vasopressor-dependent cardiovascular surgery patients

**Citation:** Critical Care, March 2016, vol./is. 20/1(no pagination), 1364-8535;1466-609X (March 24, 2016)

**Author(s):** Saito S., Uchino S., Takinami M., Uezono S., Bellomo R.

**Abstract:** Background: In vasopressor-dependent patients who had undergone cardiovascular surgery, we examined whether those with progression of acute kidney injury (AKI) had a greater difference (deficit) between premorbid and within-ICU hemodynamic pressure-related parameters compared to those without AKI progression. Methods: We assessed consecutive adults who underwent cardiovascular surgery and who stayed in our ICU for at least 48hours and received vasopressor support for more than 4hours. We obtained premorbid and vasopressor-associated, time-weighted average values for hemodynamic pressure-related parameters (systolic [SAP], diastolic [DAP], and mean arterial pressure [MAP]; central venous pressure [CVP], mean perfusion pressure [MPP], and diastolic perfusion pressure [DPP]) and calculated deficits in those values. We defined AKI progression as an increase of at least one Kidney Disease: Improving Global Outcomes stage. Results: We screened 159 patients who satisfied the inclusion criteria and identified 76 eligible patients. Thirty-six patients (47%) had AKI progression. All achieved pressure-related values were similar between patients with or without AKI progression. However, deficits in DAP (P = 0.027), MPP (P = 0.023), and DPP (P = 0.002) were significantly greater in patients with AKI progression. Conclusions: Patients with AKI progression had greater DAP, MPP, and DPP deficits compared to patients without AKI progression. Such deficits might be modifiable risk factors for the prevention of AKI progression.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Rare case of sarcoidosis presenting with pancytopenia, acute renal failure and hypercalcaemia
Abstract: Background Stratifying patient risk for acute kidney injury (AKI) prior to percutaneous coronary intervention (PCI) can enable clinicians to tailor their approach to minimize AKI. The National Cardiovascular Data Registry (NCDR) CathPCI Registry recently developed 2 prediction models: for AKI and AKI requiring dialysis (AKI-D). Objectives This study sought to externally validate the NCDR AKI and AKI-D models in a Japanese population. Determining the generalizability of the U.S. model could support quality improvement efforts in Japan. Methods The NCDR prediction models were applied to 11,041 consecutive patients in the Japanese multicenter PCI registry. AKI was defined as an absolute increase >0.3 mg/dl or a relative increase of 50% in serum creatinine, in accordance with the definition of AKI Network criteria; AKI-D was defined as initiation of dialysis after PCI. Discrimination and calibration of the NCDR models were tested in the Japanese cohort. If the model was perfectly calibrated, the slope and intercept would equal 1.0 and 0.0, respectively. Results In the Japanese PCI cohort, AKI and AKI-D occurred in 10.5% and 1.5% of patients, respectively. The NCDR AKI prediction model showed good discrimination (c-statistic = 0.76) and calibration (slope = 0.93 and intercept = -0.10) in both acute and nonacute PCI. The AKI-D prediction model had good discrimination (c-statistic = 0.92), but while the calibration slope was good (1.04), the intercept was significantly underestimated (0.96). However, this was corrected with recalibration (slope = 1.04 and intercept = -0.087). Conclusions In a Japanese population, the NCDR AKI models validly predict post-procedural AKI and, with recalibration, AKI-D. Prospective use of these models to inform clinical decision making should be tested as a means of reducing AKI after PCI in Japan. (Japan Cardiovascular Database, Percutaneous Coronary Intervention Registry; UMIN R000004736).
%. Conclusion: AKI defined by the new KDIGO criteria was associated with increased hospital mortality. Although definitions in the KDIGO criteria seem to be appropriate because of the clear relationship between mortality and stage progression on the whole, several limitations may exist, especially in stage 3. Further research should be needed to clarify the validity of the KDIGO criteria and the detailed categories.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Incidence and Risk Factors for Postcontrast Acute Kidney Injury in Survivors of Sudden Cardiac Arrest

**Citation:** Annals of Emergency Medicine, April 2016, vol./is. 67/4(469-476.e1), 0196-0644;1097-6760 (01 Apr 2016)

**Author(s):** Petek B.J., Bravo P.E., Kim F., De Boer I.H., Kudenchuk P.J., Shuman W.P., Gunn M.L., Carlbom D.J., Gill E.A., Maynard C., Branch K.R.

**Abstract:** Study objective Survivors of sudden cardiac arrest may be exposed to iodinated contrast from invasive coronary angiography or contrast-enhanced computed tomography, although the effects on incident acute kidney injury are unknown. The study objective was to determine whether contrast administration within the first 24 hours was associated with acute kidney injury in survivors of sudden cardiac arrest. Methods This cohort study, derived from a prospective clinical trial, included patients with sudden cardiac arrest who survived for 48 hours, had no history of end-stage renal disease, and had at least 2 serum creatinine measurements during hospitalization. The contrast group included patients with exposure to iodinated contrast within 24 hours of sudden cardiac arrest. Incident acute kidney injury and first-time dialysis were compared between contrast and no contrast groups and then controlled for known acute kidney injury risk factors. Results Of the 199 survivors of sudden cardiac arrest, 94 received iodinated contrast. Mean baseline serum creatinine level was 1.3 mg/dL (95% confidence interval [CI] 1.4 to 1.5 mg/dL) for the contrast group and 1.6 mg/dL (95% CI 1.4 to 1.7 mg/dL) for the no contrast group. Incident acute kidney injury was lower in the contrast group (12.8%) than the no contrast group (17.1%; difference 4.4%; 95% CI 9.2% to 17.5%). Contrast administration was not associated with significant increases in incident acute kidney injury within quartiles of baseline serum creatinine level or after controlling for age, sex, race, congestive heart failure, diabetes, and admission serum creatinine level by regression analysis. Older age was independently associated with acute kidney injury. Conclusion Despite elevated baseline serum creatinine level in most survivors of sudden cardiac arrest, iodinated contrast administration was not associated with incident acute kidney injury even when other acute kidney injury risk factors were controlled for. Thus, although acute kidney injury is not uncommon among survivors of sudden cardiac arrest, early (<24 hours) contrast administration from imaging procedures did not confer an increased risk for acute kidney injury.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Acute kidney injury - Nephrology's latest problem child

**Citation:** International Journal of Clinical Practice, April 2016, vol./is. 70/4(300-301), 1368-5031;1742-1241 (01 Apr 2016)

**Author(s):** Goldsmith D.

**Publication Type:** Journal: Editorial

**Source:** EMBASE

**Title:** Antibiotic related acute kidney injury in patients treated for open fractures

**Citation:** Injury, 2016, vol./is. 47/3(653-657), 0020-1383;1879-0267 (2016)

**Author(s):** Pannell W.C., Banks K., Hahn J., Inaba K., Marecek G.S.

**Abstract:** Objective: Antibiotic administration during the treatment of open fractures has been shown to reduce infection rates and is considered a critical step in the management of these injuries. The purpose of this study was to determine if aminoglycoside administration during the treatment of open fractures leads to acute kidney injury. Methods: Patient records at a level I trauma centre were reviewed for adult patients who presented in 2014 with open fractures were screened for inclusion. Patients were excluded with fractures of the phalanges, metatarsals, and metacarpals, with isolated traumatic arthrotomies, or pre-existing renal dysfunction. Charts were reviewed for patient age, gender, race, past medical history, medication history, injury severity score, intravenous
dye studies and fracture type. Patients were divided into those given cefazolin (Group A) and cefazolin with gentamicin (Group B). Laboratory values were used to determine which patients developed kidney dysfunction as measured using the RIFLE criteria. Wilcoxon-Mann-Whitney test and Chi-square were used to compare interval and categorical variables, respectively. Significance was set at p < 0.05. Results: One-hundred and fifty-nine patients met inclusion criteria. Forty-one (25%) patients were given cefazolin alone and 113 (68%) patients were given cefazolin with gentamicin. Ten (18%) patients with Gustilo-Anderson type III fractures were given cefazolin alone and 67 (67%) patients with types I or II fractures were given a cefazolin with gentamicin. Baseline characteristics and risk factors for renal dysfunction did not vary between groups. Two (4.8%) patients in Group A and 5 (4%) patients in Group B developed acute kidney injury (P = 0.599). Conclusions: Gentamicin use during the treatment of open fractures does not lead to increased rates of renal dysfunction when used in patients with normal baseline renal function.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Elevated creatinine in a patient with cirrhosis

**Citation:** Clinical Liver Disease, March 2016, vol./is. 7/3(48-52), 2046-2484 (01 Mar 2016)

**Author(s):** Klavan H.L., Fortune B.E.

**Publication Type:** Journal: Review

**Source:** EMBASE

**Title:** Comparison of acute kidney injury classifications in patients undergoing transcatheter aortic valve implantation: Predictors and long-term outcomes

**Citation:** Catheterization and Cardiovascular Interventions, February 2016, vol./is. 87/3(523-531), 1522-1946;1522-726X (15 Feb 2016)

**Author(s):** Koifman E., Segev A., Fefer P., Barbash I., Sabbag A., Medvedovsky D., Spiegelstein D., Hamdan A., Hay I., Raanani E., Goldenberg I., Guetta V.

**Abstract:** Background Acute kidney injury (AKI) was demonstrated to adversely affect outcome in patients undergoing transcatheter aortic valve implantation (TAVI). We compared predictors for AKI and associated outcomes according to various definitions among patients undergoing TAVI in a tertiary medical center. Methods Two-hundred and seventeen TAVI patients were evaluated for the occurrence of AKI according to Kidney Disease Improving Global Outcomes (KDIGO)/Valve Academic Research Consortium (VARC-2) and Risk Injury Failure Loss End-Stage (RIFLE) definitions. Multivariate analysis was conducted to assess predictors of AKI. Cox hazard ratio was used to evaluate long-term mortality in this patient population. Results AKI occurred in 23 and 21% of patients (n = 49, n = 46) according to KDIGO/VARC-2 and RIFLE definitions, respectively, with an approximate 10% of disagreement between both systems. Predictors of AKI according to KDIGO/VARC-2 were chronic obstructive pulmonary disease (COPD; OR = 2.66, P = 0.01), PVD (OR = 3.45, P = 0.02) and a lower baseline eGFR (OR = 1.03 per 1 mL/min/1.73 m<sup>2</sup> decrease, P = 0.02). While BMI (OR = 1.12, P = 0.01), prior ischemic heart disease (OR = 2.35, P = 0.04) and COPD (OR = 2.18, P = 0.04) were associated with AKI as defined by the RIFLE definition. AKI defined by either classification was independently associated with long-term mortality (HR = 1.63, for the KDIGO/VARC-2 definition and HR = 1.60 for RIFLE definition, P = 0.04 for both models), with borderline superiority of the KDIGO/VARC-2 classification. Conclusions Different clinical characteristics predict the occurrence of AKI after TAVI when RIFLE and KDIGO/VARC-2 classifications are used. Both classification systems of AKI identify patients with increased risk for long-term mortality, with superiority of the KDIGO/VARC-2 definition, which should be used for AKI grading.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Inhibiting microrna-449 attenuates cisplatin-induced injury in nrk-52e cells possibly via regulating the sirt1/p53/bax pathway

**Citation:** Medical Science Monitor, March 2016, vol./is. 22/(818-823), 1234-1010;1643-3750 (12 Mar 2016)

**Author(s):** Qin W., Xie W., Yang X., Xia N., Yang K.

**Abstract:** Background: Acute kidney injury (AKI) is quite common in the patients who frequently use the anticancer drug cisplatin. microRNAs (miRNAs) are powerful tools in modulating the expression of key factors in
disease progression, but little is known about roles of miRNAs in AKI. This study explored the expression and function of miR-449 in cisplatin-induced AKI. Material/Methods: Rat renal proximal tubular cell line NRK-52E was used for cisplatin treatment and miR-449 sponge transfection. MTT assay and flow cytometry were performed to detect cell viability and apoptosis in different cell groups. Protein expression of sirtuin 1 (SIRT1), acetylated p53, and BCL-associated X protein (BAX) was detected to deduce the possible regulatory mechanism of miR-449. Results: Results showed that cisplatin treatment in NRK-52E cells significantly up-regulated miR-449 levels (P<0.05), inhibited cell viability (P<0.05), accelerated cell apoptosis (P<0.05), and changed SIRT1, acetylated p53, and BAX protein levels (P<0.01). However, inhibiting miR-449 by its sponge transfection in cisplatin-treated cells significantly promoted cell viability (P<0.05), suppressed cell apoptosis (P<0.05), elevated SIRT1 expression (P<0.01), and inhibited acetylated p53 and BAX protein levels (P<0.001). Conclusions: These results indicate that inhibiting miR-449 allows the attenuation of cisplatin-induced injury in NRK-52E cells, suggesting that miR-449 is a potential target for treating AKI. miR-449 regulates the SIRT1/p53/BAX pathway, which may be its possible mechanism in modulating cell apoptosis of cisplatin-induced AKI. Further verification and a thorough understanding are necessary for targeting miR-449 in AKI treatment.

Publication Type: Journal: Article

Source: EMBASE

Title: The description of a method for accurately estimating creatinine clearance in acute kidney injury

Citation: Mathematical Biosciences, May 2016, vol./is. 275/(107-114), 0025-5564;1879-3134 (May 01, 2016)

Author(s): Mellas J.

Abstract: Background: Acute kidney injury (AKI) is a common and serious condition encountered in hospitalized patients. The severity of kidney injury is defined by the RIFLE, AKIN, and KDIGO criteria which attempt to establish the degree of renal impairment. The KDIGO guidelines state that the creatinine clearance should be measured whenever possible in AKI and that the serum creatinine concentration and creatinine clearance remain the best clinical indicators of renal function. Neither the RIFLE, AKIN, nor KDIGO criteria estimate actual creatinine clearance. Furthermore there are no accepted methods for accurately estimating creatinine clearance (K) in AKI. Study design: The present study describes a unique method for estimating K in AKI using urine creatinine excretion over an established time interval (E), an estimate of creatinine production over the same time interval (P), and the estimated static glomerular filtration rate (sGFR), at time zero, utilizing the CKD-EPI formula. Using these variables estimated creatinine clearance (Ke) = E/P * sGFR. Setting and participants: The method was tested for validity using simulated patients where actual creatinine clearance (Ka) was compared to Ke in several patients, both male and female, and of various ages, body weights, and degrees of renal impairment. These measurements were made at several serum creatinine concentrations in an attempt to determine the accuracy of this method in the non-steady state. In addition E/P and Ke was calculated in hospitalized patients, with AKI, and seen in nephrology consultation by the author. In these patients the accuracy of the method was determined by looking at the following metrics; E/P > 1, E/P < 1, E = P in an attempt to predict progressive azotemia, recovering azotemia, or stabilization in the level of azotemia respectively. In addition it was determined whether Ke < 10. ml/min agreed with Ka and whether patients with AKI on renal replacement therapy could safely terminate dialysis if Ke was greater than 5. ml/min. Outcomes and results: In the simulated patients there were 96 measurements in six different patients where Ka was compared to Ke. The estimated proportion of Ke within 30% of Ka was 0.907 with 95% exact binomial proportion confidence limits. The predictive accuracy of E/P in the study patients was also reported as a proportion and the associated 95% confidence limits: 0.848 (0.800, 0.896) for E/P < 1; 0.939 (0.904, 0.974) for E/P > 1 and 0.907 (0.841, 0.973) for 0.9 < E/P < 1.1. Ke < 10. ml/min correlated very well with Ka, while Ke > 5. ml/min accurately predicted the ability to terminate renal replacement therapy in AKI. Limitations: Include the need to measure urine volume accurately. Furthermore the precision of the method requires accurate estimates of sGFR, while a reasonable measure of P is crucial to estimating Ke. Conclusions: The present study provides the practitioner with a new tool to estimate real time K in AKI with enough precision to predict the severity of the renal injury, including progression, stabilization, or improvement in azotemia. It is the author’s belief that this simple method improves on RIFLE, AKIN, and KDIGO for estimating the degree of renal impairment in AKI and allows a more accurate estimate of K in AKI.

Publication Type: Journal: Article

Source: EMBASE

Title: Overestimation of Glomerular Filtration Rate among Critically Ill Adults with Hospital-Acquired Oligoanuric Acute Kidney Injury

Citation: Journal of Pharmacy Practice, April 2016, vol./is. 29/2(125-131), 0897-1900;1531-1937 (01 Apr 2016)

Author(s): Frazee E.N., Personett H.A., Wood-Wentz C.M., Herasevich V., Lieske J.C., Kashani K.B.
**Abstract:** Background: Medication use in the intensive care unit (ICU) depends on creatinine-based glomerular filtration rate (GFR) estimates. Urine output deterioration may precede the creatinine rise resulting in delayed recognition of GFR reductions. Our objective was to quantify the disparity between estimated GFR (eGFR) and true GFR in ICU patients with hospital-acquired oligoanuric acute kidney injury (hAKI). Methods: This single-center cohort study examined adults who met the Acute Kidney Injury Network stage III urine output criterion >48 hours after ICU admission. True GFR was <15 mL/min/1.73 m², and eGFR was described by 6 different creatinine-based equations. True GFR and eGFR were compared on the day of hAKI diagnosis and followed for 4 days using multivariable linear regression with generalized estimating equations, adjusting for day and method. Results: Of the 691 patients screened, we enrolled 61 patients. After adjustment for multiple comparisons and day, there were significant differences in eGFR between the estimation methods and true GFR (P <.001). After day adjustment, eGFR overestimated true GFR by 17 to 50 mL/min/1.73 m² and overestimation persisted through the fourth day of hAKI (P <.001). Conclusion: Creatinine-based equations overestimated GFR in ICU patients with hAKI. This study highlights a population at risk of medication misadventures in whom systems optimization should be considered.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Role of neutrophil gelatinase-associated lipocalin in the diagnosis and early treatment of acute kidney injury in a case series of patients with acute decompensated heart failure: A case series

**Citation:** Cardiology Research and Practice, 2016, vol./is. 2016/(no pagination), 2090-8016;2090-0597 (2016)

**Author(s):** Angeletti S., Fogolari M., Morolla D., Capone F., Costantino S., Spoto S., De Cesaris M., Lo Presti A., Ciccozzi M., Dicuonzo G.

**Abstract:** Patients with acute decompensated heart failure (ADHF) frequently develop worsening in renal function until Acute Kidney Injury (AKI). The use of kidney injury biomarkers could be useful in the early diagnosis of AKI. In the present study, the role of the neutrophil gelatinase-associated lipocalin (NGAL), compared to the standard creatinine, in ADHF patients, was analyzed to evaluate if an early treatment could affect the outcome. A case series of 24 ADHF patients was enrolled and patients randomly divided in two groups (Group A and Group B). In Group A, NGAL, creatinine, and EGFR were measured, while in Group B, creatinine and EGFR alone were measured. NGAL was measured by turbidimetric immunoassay and creatinine using an enzymatic spectrophotometric method. In presence of AKI, creatinine increase and EGFR decrease were significantly lower in Group A than in Group B, whereas in absence of AKI the difference between the two groups was not significant. Hospitalization stay was significantly lower in Group A (receiving early treatment based on NGAL) than in Group B. In ADHF patients, plasma NGAL in combination with creatinine was superior to the standard creatinine in the diagnosis and early treatment of AKI with a better outcome and a decreased hospital stay.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Tenofovir induced acute kidney injury in a patient with unilateral renal agenesis despite initially non-impaired renal function

**Citation:** European Journal of Medical Research, December 2011, vol./is. 16/12(564), 0949-2321;2047-783X (02 Dec 2011)

**Author(s):** Schleenvoigt B.T., Stallmach A., Pletz M.W.

**Abstract:** Nephrotoxicity is observed in 1.6 % of patients treated with tenofovir disoproxil fumarat (Fux 2007).

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Evaluation of intermittent hemodialysis in critically ill cancer patients with acute kidney injury using single-pass batch equipment

**Citation:** PLoS ONE, March 2016, vol./is. 11/3(no pagination), 1932-6203 (March 2016)

Abstract: Background Data on renal replacement therapy (RRT) in cancer patients with acute kidney injury (AKI) in the intensive care unit (ICU) is scarce. The aim of this study was to assess the safety and the adequacy of intermittent hemodialysis (IHD) in critically ill cancer patients with AKI. Methods and Findings In this observational prospective cohort study, 149 ICU cancer patients with AKI were treated with 448 single-pass batch IHD procedures and evaluated from June 2010 to June 2012. Primary outcomes were IHD complications (hypotension and clotting) and adequacy. A multiple logistic regression was performed in order to identify factors associated with IHD complications (hypotension and clotting). Patients were 62.2 +/- 14.3 years old, 86.6% had a solid cancer, sepsis was the main AKI cause (51%) and in-hospital mortality was 59.7%. RRT session time was 240 (180-300) min, blood/dialyate flow was 250 (200-300) mL/min and UF was 1000 (0-2000) mL. Hypotension occurred in 25% of the sessions. Independent risk factors (RF) for hypotension were dialysate conductivity (each 0.1 mS/cm, OR 0.81, CI 0.69-0.95), initial mean arterial pressure (each 10 mmHg, OR 0.49, CI 0.40-0.61) and SOFA score (OR 1.16, CI 1.03-1.30). Clotting and malfunctioning catheters (MC) occurred in 23.8% and 29.2% of the procedures, respectively. Independent RF for clotting were heparin use (OR 0.57, CI 0.33-0.99), MC (OR 3.59, CI 2.24-5.77) and RRT system pressure increase over 25% (OR 2.15, CI 1.61-4.17). Post RRT blood tests were urea 71 (49-104) mg/dL, creatinine 2.71 (2.10-3.8) mg/dL, bicarbonate 24.1 (22.5-25.5) mEq/Land K3.8 (3.5-4.1) mEq/L. Conclusion IHD for critically ill patients with cancer and AKI offered acceptable hemodynamic stability and provided adequate metabolic control.

Publication Type: Journal: Article

Source: EMBASE

Title: Targeted fibrillar nanocarbon RNAi treatment of acute kidney injury

Citation: Science Translational Medicine, March 2016, vol./is. 8/331(no pagination), 1946-6234;1946-6242 (23 Mar 2016)

Author(s): Alidori S., Akhavein N., Thorek D.L.J., Behling K., Romin Y., Queen D., Beattie B.J., Manova-Todorova K., Bergkvist M., Scheinberg D.A., McDevitt M.R.

Abstract: RNA interference has tremendous yet unrealized potential to treat a wide range of illnesses. Innovative solutions are needed to protect and selectively deliver small interfering RNA (siRNA) cargo to and within a target cell to fully exploit siRNA as a therapeutic tool in vivo. Herein, we describe ammonium-functionalized carbon nanotube (fCNT)-mediated transport of siRNA selectively and with high efficiency to renal proximal tubule cells in animal models of acute kidney injury (AKI). fCNT enhanced siRNA delivery to tubule cells compared to siRNA alone and effectively knocked down the expression of several target genes, including Trp53, Mep1b, Ctr1, and EGFP. A clinically relevant cisplatin-induced murine model of AKI was used to evaluate the therapeutic potential of fCNT-targeted siRNA to effectively halt the pathogenesis of renal injury. Prophylactic treatment with a combination of fCNT/siMep1b and fCNT/siTrp53 significantly improved progression-free survival compared to controls via a mechanism that required concurrent reduction of meprin-1b and p53 expression. The fCNT/siRNA was well tolerated, and no toxicological consequences were observed in murine models. Toward clinical application of this platform, fCNTs were evaluated for the first time in nonhuman primates. The rapid and kidney-specific pharmacokinetic profile of fCNT in primates was comparable to what was observed in mice and suggests that this approach is amenable for use in humans. The nanocarbon-mediated delivery of siRNA provides a therapeutic means for the prevention of AKI to safely overcome the persistent barrier of nephrotoxicity during medical intervention.

Publication Type: Journal: Article

Source: EMBASE

Title: Adverse effects of oral nonselective and cyclooxygenase-2-selective nsaid on hospitalization for acute kidney injury: A nested case-control cohort study

Citation: Medicine (United States), March 2016, vol./is. 95/9(no pagination), 0025-7974;1536-5964 (04 Mar 2016)

Author(s): Chou C.-I., Shih C.-J., Chen Y.-T., Ou S.-M., Yang C.-Y., Kuo S.-C., Chu D.

Abstract: To investigate the association between the use of nonselective or cyclooxygenase (COX)-2-selective nonsteroidal antiinflammatory drugs (NSAIDs) and risk of acute kidney injury (AKI) in a general Asian population. We conducted an observational, nationwide, nested case-control cohort study using Taiwan’s National Health Insurance Research Database between 2010 and 2012. AKI cases were defined as hospitalization with a principle diagnosis of AKI. Each case was matched to 4 randomly selected controls based on age, sex, and the month and year of cohort entry. Odds ratios (ORs) were used to demonstrate the association between hospitalization for AKI and current, recent, or past use of an oral NSAID. During the study period, we identified 6199 patients with AKI and 24,796 matched controls. Overall, current users (adjusted OR 2.73, 95% confidence
interval [CI] 2.28-3.28) and recent users (adjusted OR 1.17, 95% CI 1.01-1.35) were associated with increased risk of hospitalization for AKI. The risk was also similar for nonselective NSAIDs. However, neither current nor recent use of COX-2 inhibitors was significantly associated with AKI events. Our study supported that the initiation of nonselective NSAIDs rather than COX-2 inhibitors is associated with an increased risk of AKI requiring hospitalization. Future randomized trials are needed to elucidate these findings.

Publication Type: Journal: Article
Source: EMBASE
Title: Early versus late initiation of renal replacement therapy in critically ill patients with acute kidney injury (The ELAIN-Trial): Study protocol for a randomized controlled trial
Citation: Trials, March 2016, vol./is. 17/1(no pagination), 1745-6215 (March 18, 2016)
Author(s): Zarbock A., Gerss J., Van Aken H., Boanta A., Kellum J.A., Meersch M.

Abstract: Background: Acute kidney injury remains a common complication in critically ill patients and despite multiple trials and observational studies, the optimal timing for initiation of renal replacement therapy is still unclear. The early versus late initiation of renal replacement therapy in critically ill patients with acute kidney injury (ELAIN) study is a randomized, single-center, prospective, two-arm, parallel group trial to reduce mortality in patients with severe acute kidney injury. We describe the study design and discuss aspects of the need for a trial in this patient cohort. Methods/design: Our plan is to randomize critically ill patients with acute kidney injury to 'early' or 'late' initiation of renal replacement therapy according to stage 2 and 3 of the KDIGO classification using a specific trial protocol. We plan to guide data collection and analysis using pre-existing definitions and testing. The primary endpoint is overall survival in a 90-day follow-up period. Secondary endpoints include 28-day, 60-day, 90-day and 1-year all-cause mortality, recovery of renal function, ICU and hospital length-of-stay. The primary analysis will be an intention-to-treat analysis; secondary analyses include treated analyses. We will also specify rules for handling data and determining outcome. Discussion: Several challenges for study design and execution can be seen in our trial, and it should generate results that will inform and influence the practice of renal replacement therapy in critically ill patients with acute kidney injury. Trial registration: German Clinical Trials Register: DRKS00004367 (www.germanctr.de); 28 May 2013.

Publication Type: Journal: Article
Source: EMBASE
Title: Intraperitoneal Bladder Perforation and Life-threatening Renal Failure in a Neonate Following Circumcision with the Plastibell Device
Citation: Urology, March 2016, vol./is. 89/(134-136), 0090-4295;1527-9995 (01 Mar 2016)
Author(s): Dwyer M., Peffer N., Fuller T., Cannon G.

Abstract: We present the case of an infant who suffered intraperitoneal bladder perforation secondary to routine neonatal circumcision with the Plastibell device. On day-of-life 5, the patient presented with abdominal distention, vomiting, diarrhea, and severe acute renal failure. After removal of a distal meatal obstruction caused by the Plastibell device and open repair of the bladder defect, the patient had an uneventful recovery with rapid return of renal function. Despite the relative safety of the Plastibell, this case underscores the importance of careful device placement, parental education, keen clinical judgment, and prompt intervention when indicated.

Publication Type: Journal: Article
Source: EMBASE
Title: Acute kidney injury in children with plasmodium falciparum malaria: Determinants for mortality
Citation: Peritoneal Dialysis International, March 2016, vol./is. 36/2(213-217), 0896-8608;1718-4304 (March-April 2016)
Author(s): Prasad R., Mishra O.P.

Abstract: Background: Acute kidney injury (AKI) in P. falciparum malaria infection is an important morbidity in children. The purpose of the present study was done to observe the renal involvement, associated morbidities and outcome. Methods: Out of 156 patients with severe P. falciparum malaria, diagnosed on the basis of compatible clinical presentations and positive malarial parasites in the peripheral blood smear and/or histidine rich protein 2 antigen, 31 had AKI at presentation and were analyzed. Results: Of 31 (19.9%) patients with AKI, 4
were classified at risk, 11 injury, and 16 failure stage, as per pRIFLE criteria (pediatric version of RIFLE [R = risk, I = injury, F = failure, L = loss E = end-stage kidney disease]). Mean age of children with AKI was 7.7 +/- 3.2 years. A significantly higher proportion of patients with AKI had hypoglycemia (41.9%), pulmonary edema (32.2%), and disseminated intravascular coagulation (DIC) (29.0%) compared to those without AKI (18.4%, 4.8%, and 3.2%, respectively). Twelve patients (38.7%) required peritoneal dialysis (PD), 8 (25.8%) died, and all were in failure stage. The non-survivors had significantly higher blood urea (p = 0.005) and serum creatinine levels (p = 0.042), lower glomerular filtration rate (p < 0.001), longer duration of illness (p = 0.003), and oliguria/anuria (p = 0.001) than survivors at admission. On logistic regression analysis, the disseminated intravascular coagulation (DIC), jaundice and parasite density (> 3+) were found to be significant factors contributing to mortality in children with AKI. Conclusions: Acute kidney injury in falciparum malaria is one of the severe systemic complications. Duration of illness and presence of comorbidities adversely affected the outcome.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** Combination of urinary biomarkers improves early detection of acute kidney injury in patients with heart failure

**Citation:** Circulation Journal, March 2016, vol./is. 80/4(1017-1023), 1346-9843;1347-4820 (25 Mar 2016)

**Author(s):** Yang C.-H., Chang C.-H., Chen T.-H., Fan P.-C., Chang S.-W., Chen C.-C., Chu P.-H., Chen Y.-T., Yang H.-Y., Yang C.-W., Chen Y.-C.

**Abstract:** Background: Acute kidney injury (AKI) is associated with mortality and repeated hospitalization, and is frequently encountered in patients with acute decompensated heart failure (ADHF). However, few effective tools exist for early AKI identification and risk stratification. Methods and Results: This was a prospective observational study conducted in the coronary care unit (CCU) of a tertiary care university hospital. Patients with a diagnosis of ADHF and who were using diuretics were enrolled. Samples collected between December 2013 and February 2015 were tested for serum cystatin C (Cys-C), urinary neutrophil gelatinase-associated lipocalin, and kidney injury molecule-1 (KIM-1). Demographic, clinical, and laboratory data were evaluated. A total of 103 adult patients with a mean age of 68 years were investigated. AKI was diagnosed in 49 patients (47.6%). For predicting intrinsic AKI on the first day of CCU admission, a combination of Cys-C and urine KIM-1 yielded an excellent area under the receiver operating characteristic curve of 0.828, a sensitivity of 71.0%, and specificity of 43.0%, for an overall accuracy of 78%. Conclusions: In this study, we found that combinations of the biomarker (Cys-C and KIM-1) were an effective clinical model for predicting AKI in patients with ADHF. The biomarker was also useful for differentiating subclinical AKI in patients with ADHF.

**Publication Type:** Journal: Article

**Source:** EMBASE

**Title:** The Complex Relationship of Extracorporeal Membrane Oxygenation and Acute Kidney Injury: Causation or Association?

**Citation:** BioMed Research International, 2016, vol./is. 2016/(no pagination), 2314-6133;2314-6141 (2016)

**Author(s):** Kilburn D.J., Shekar K., Fraser J.F.

**Abstract:** Extracorporeal membrane oxygenation (ECMO) is a modified cardiopulmonary bypass (CPB) circuit capable of providing prolonged cardiorespiratory support. Recent advancement in ECMO technology has resulted in increased utilisation and clinical application. It can be used as a bridge-to-recovery, bridge-to-bridge, bridge-to-transplant, or bridge-to-decision. ECMO can restitute physiology in critically ill patients, which may minimise the risk of progressive multiorgan dysfunction. Alternatively, iatrogenic complications of ECMO clearly contribute to worse outcomes. These factors affect the risk: benefit ratio of ECMO which ultimately influence commencement/timing of ECMO. The complex interplay of pre-ECMO, ECMO, and post-ECMO pathophysiological processes are responsible for the substantial increased incidence of ECMO-associated acute kidney injury (EAKI). The development of EAKI significantly contributes to morbidity and mortality; however, there is a lack of evidence defining a potential benefit or causative link between ECMO and AKI. This area warrants investigation as further research will delineate the mechanisms involved and subsequent strategies to minimise the risk of EAKI. This review summarizes the current literature of ECMO and AKI, considers the possible benefits and risks of ECMO on renal function, outlines the related pathophysiology, highlights relevant investigative tools, and ultimately suggests an approach for future research into this under investigated area of critical care.

**Publication Type:** Journal: Review

**Source:** EMBASE
Title: Clinical utility of urine neutrophil gelatinase-associated lipocalin measured at admission to predict outcomes in heterogeneous population of critically ill patients

Citation: Indian Journal of Nephrology, March 2016, vol./is. 26/2(119-124), 0971-4065;1998-3662 (March-April 2016)


Abstract: Urine neutrophil gelatinase-associated lipocalin (uNGAL) is a reliable early biomarker of acute kidney injury (AKI) in a homogeneous patient population. However, its utility in a heterogeneous population of critically ill, in whom the time of onset of renal insult is often unclear, is not clearly established. We evaluated the ability of a single measurement of uNGAL in a heterogeneous adult population, on admission to intensive care unit (ICU), to predict the occurrence of AKI and hospital mortality. One hundred and two consecutive adult patients had uNGAL measured within 8 h of admission to ICU. The demographic and laboratory data were collected at admission. The diagnosis of AKI was based on AKI Network (AKIN) criteria. The primary outcome was the development of AKI, and the secondary outcome was hospital mortality. The mean age was 54 +/- 16.4 years and 65% were males. Urine NGAL (ng/ml) was 69 +/- 42 in patients with AKI (n = 42) and 30.4 +/- 41.7 in those without AKI (P < 0.001). The area under the receiver operating characteristic (ROC) curve for prediction of AKI was 0.79 and for serum creatinine (SCr) was 0.88. The sensitivity and specificity for a cut-off value of uNGAL of 75 ng/ml to predict AKI were 0.5 and 0.85 respectively. uNGAL > 75 ng/ml was a strong (odd ratio = 5.17, 95% confidence interval: 1.39-19.3) and independent predictor of hospital mortality. A single measurement of uNGAL at admission to ICU exhibited good predictive ability for AKI though the sensitivity was low. The predictive ability of uNGAL was inferior to simultaneously measured SCr at admission, hence limited its clinical utility to predict AKI. However, admission uNGAL was a strong, independent predictor of hospital mortality.

Publication Type: Journal: Article

Source: EMBASE

Title: An RNA interference screen identifies new avenues for nephroprotection

Citation: Cell Death and Differentiation, April 2016, vol./is. 23/4(608-615), 1350-9047;1476-5403 (01 Apr 2016)

Author(s): Zynda E.R., Schott B., Gruener S., Wernher E., Nguyen G.D., Ebeling M., Kandel E.S.

Abstract: Acute kidney injury is a major public health problem, which is commonly caused by renal ischemia and is associated with a high risk of mortality and long-term disability. Efforts to develop a treatment for this condition have met with very limited success. We used an RNA interference screen to identify genes (BCL2L14, BLOC1S2, C2ORF42, CPT1A, FBP1, GCNT3, RHOB, SCIN, TACR1, and TNFAIP6) whose suppression improves survival of kidney epithelial cells in in vitro models of oxygen and glucose deprivation. Some of the genes also modulate the toxicity of cisplatin, an anticancer agent whose use is currently limited by nephrotoxicity. Furthermore, pharmacological inhibition of TACR1 product NK1R was protective in a model of mouse renal ischemia, attesting to the in vivo relevance of our findings. These data shed new light on the mechanisms of stress response in mammalian cells, and open new avenues to reduce the morbidity and mortality associated with renal injury.

Publication Type: Journal: Article

Source: EMBASE

Title: Renal lymph: A window for renal pathophysiology?

Citation: Journal of Physiology, March 2016, vol./is. 594/6(1519-1519), 0022-3751;1469-7793 (15 Mar 2016)

Author(s): Michel C.C.

Publication Type: Journal: Article

Source: EMBASE

Title: Hyper/hypoglycemia and acute kidney injury in critically ill patients

Citation: Clinical Nutrition, April 2016, vol./is. 35/2(317-321), 0261-5614;1532-1983 (01 Apr 2016)

Author(s): Fiaccadori E., Sabatino A., Morabito S., Bozzoli L., Donadio C., Maggiore U., Regolisti G.
Abstract: Background & aims: Abnormalities of blood glucose (BG) concentration (hyper- and hypoglycemia), now referred to with the cumulative term of dysglycemia, are frequently observed in critically ill patients, and significantly affect their clinical outcome. Acute kidney injury (AKI) may further complicate glycemic control in the same clinical setting. This narrative review was aimed at describing the pathogenesis of hyper- and hypoglycemia in the intensive care unit (ICU), with special regard to patients with AKI. Moreover, the complex relationship between AKI, glycemic control, hypoglycemic risk, and outcomes was analyzed. Methods: An extensive literature search was performed, in order to identify the relevant studies describing the epidemiology, pathogenesis, treatment and outcome of hypo- and hyperglycemia in critically ill patients with AKI. Results and conclusion: Patients with AKI are at increased risk of both hyper- and hypoglycemia. The available evidence does not support a protective effect on the kidney by glycemic control protocols employing Intensive Insulin Treatment (IIT), i.e. those aimed at maintaining normal BG concentrations (80-110 mg/dl). Recent guidelines taking into account the high risk for hypoglycemia associated with IIT protocols in critically ill patients, now suggest higher BG concentration targets (<180 mg/dl or 140-180 mg/dl) than those previously recommended (80-110 mg/dl). Notwithstanding the limited evidence available, it seems reasonable to extend these indications also to ICU patients with AKI.

Publication Type: Journal: Review

Source: EMBASE

Title: Urinary biomarkers indicative of apoptosis and acute kidney injury in the critically ill

Citation: PLoS ONE, February 2016, vol./is. 11/2(no pagination), 1932-6203 (February 2016)


Abstract: Background & aims: Abnormalities of blood glucose (BG) concentration (hyper- and hypoglycemia), now referred to with the cumulative term of dysglycemia, are frequently observed in critically ill patients, and significantly affect their clinical outcome. Acute kidney injury (AKI) may further complicate glycemic control in the same clinical setting. This narrative review was aimed at describing the pathogenesis of hyper- and hypoglycemia in the intensive care unit (ICU), with special regard to patients with AKI. Moreover, the complex relationship between AKI, glycemic control, hypoglycemic risk, and outcomes was analyzed. Methods: An extensive literature search was performed, in order to identify the relevant studies describing the epidemiology, pathogenesis, treatment and outcome of hypo- and hyperglycemia in critically ill patients with AKI. Results and conclusion: Patients with AKI are at increased risk of both hyper- and hypoglycemia. The available evidence does not support a protective effect on the kidney by glycemic control protocols employing Intensive Insulin Treatment (IIT), i.e. those aimed at maintaining normal BG concentrations (80-110 mg/dl). Recent guidelines taking into account the high risk for hypoglycemia associated with IIT protocols in critically ill patients, now suggest higher BG concentration targets (<180 mg/dl or 140-180 mg/dl) than those previously recommended (80-110 mg/dl). Notwithstanding the limited evidence available, it seems reasonable to extend these indications also to ICU patients with AKI.

Publication Type: Journal: Article

Source: EMBASE