Abstract

1. Cardinale D, Cosentino N, Moltrasio M et al. Acute kidney injury after lung cancer surgery: incidence and clinical relevance, predictors, and role of N-terminal pro B-type natriuretic peptide. Lung Cancer 2018; 123: 155–9
2. Licker M, Cartier V, Robert J et al. Risk factors of acute kidney injury according to RIFLE criteria after lung cancer surgery. Ann Thorac Surg 2011; 91: 844–50
3. Luo X et al. Kidney Disease: Improving Global Outcomes (KDIGO) Acute Kidney Injury Work Group. Comparison of different diagnostic criteria of acute kidney injury in critically ill patients. Crit Care 2014; 18: R144.4
4. KDIGO clinical practice guideline for acute kidney injury. Kidney Int 2012; 2: 1–138

BACKGROUND AND AIMS: During lung surgery, preoperative fluids are given in restricted manner. This is in correspondence with the fact that lungs produce polyphasic injury during surgery and increased levels of different inflammation, traumatic and stress markers, on one side and a lack of fluids that complicate the transfer of water and kidney function on the other side [1]. One lung ventilation additionally complicates ventilation/perfusion ratio in the lungs, has overall impact on the whole body and to novel knowledge it indirectly leads to kidneys hypoperfusion and injury [2]. The aim of our study is to evaluate the level of postoperative acute kidney injury (AKI) occurrence in patients who underwent OLV.

METHOD: In prospective study, 60 patients that underwent lung resection in OLV, BMI<30 m², without hepatic or renal endocrine diseases, aged 45–65 at the University Clinic for thoracic surgery in Skopje were included. Patients who underwent prior haemotherapy or radiotherapy were excluded. In all patients, we evaluate the demographic, clinical, preoperative state, duration of OLV, operation data and fluid assessment. Primary, we evaluate the occurrence and staging of AKI according to KDIGO criteria [3, 4]. A total of 72 h postoperatively in all patients and post hoc, we correlate its occurrence to several factors.

RESULTS: On average, patients were 59.7 ± 5.9 SD years old. More males were operated (80%). Overall, AKI stage 1 occurred in total of 13.3% (8 patients), AKI stage 22 in 3.3% (2 patients) and AKI stage 3 in 1.6% (1 patient). OLV longer than 60 min was in 85% of the patients, and all stages AKI were after this time duration. Lobectomy was done in 65% of the patients, while pulmectomy in 18.3% and bilobectomy in 16.7%. In relation to type of surgery done most of the patients that had pneumectomy had AKI (17.2%), and additionally, only in this analysed surgery group, AKI 3 occurred in 9%. In correspondence to the side operated, right side was operated in 57.7% of the patients, and most of the AKI occurred in the right-sided surgery. Most of the patients who developed AKI preoperatively had hypertension and other cardiovascular issues.

CONCLUSION: AKI occurs significantly after OLV, in relation to the type of surgery. Mainly when right-side surgery is done. However, more severe AKI occurs when pulmectomy is done. Fluid regimen, OLV longer than 60 min and some preoperative cardiovascular diseases may contribute to its occurrence.

REFERENCES

1. Cardinale D, Cosentino N, Moltrasio M et al. Acute kidney injury after lung cancer surgery: incidence and clinical relevance, predictors, and role of N-terminal pro B-type natriuretic peptide. Lung Cancer 2018; 123: 155–9
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BACKGROUND AND AIMS: The renal unit at Sunderland Royal Hospital (SRH) provides tertiary services to an area of North East England covering South Tyneside, Sunderland and County Durham. An AKI service was commenced in September 2020 at University Hospital North Durham (UHND), which is part of the County Durham and Darlington NHS Foundation Trust (CDDFT) with aims to improve recognition and treatment, support early discharge planning, and prevent severe injury for patients with AKI and renal conditions. The service comprises two specialist nurses and a team of consultant renal physicians providing in-reach at UHND across Monday–Friday 52 weeks/year, with over 700 patients seen within the first 12 months of operation.

With the introduction of this service, we carried out a review of transfer times for patients requiring transfer from UHND to SRH for inpatient renal management. Delays in patient transfer between hospitals can result in deferred treatment and poor patient outcomes, hence the importance of analysing the benchmarking the first year’s performance to inform future service development both regionally and nationally. With the use of this data, we hope to share our model with other teams and trusts with the goal of enhancing and streamlining the referral methods to renal services.

METHOD: We examined transfer data for 36 patients from CDDFT to the renal unit at SRH over a 12-month period from August 2020 to July 2021. This information looked at transfers from the time of consultant acceptance to the time of arrival on the ward and was compiled in conjunction with the AKI specialist nurses at CDDFT. Using the computer system and phone records, we were able to accurately document time of acceptance to time of arrival. Data was split into categories to enable further comparison; pre-June 2021 (when haematology patients were excluded from the inpatient ward at SRH due to protective isolation during COVID-19) increasing the availability of acute renal beds and June 2021 onwards. Additionally, we analysed patients with acute kidney injury versus those that were known to us with chronic kidney disease, and times by week days and where emergency cover is usual.

RESULTS: The data showed a median time between acceptance and arrival for patients accepted pre-June 2021 of 8 h 7 min compared with 6 h 18 min from June 2021 onwards. Median time between acceptance and arrival of acute patients was 8 h 7 min compared with 6 h 35 min for chronic kidney disease patients. Acceptance and arrival times varied also depending on time of transfer; 6 h 29 min during working hours on a weekday, 9 h 23 min out-of-hours on a weekday and 8 h 48 min on a weekend. The overall median transfer time from acceptance to arrival across all categories was 7 h 38 min.

CONCLUSION: Currently, no standard national target exists for the transfer of patients to tertiary renal services, however there are ongoing discussions surrounding this and how it could be implemented. There are difficulties in compiling data to effect change in referral methods, in part due to the inter-trust movement of patients and challenges in coding; however, our initial findings support the positive impact of the AKI service at CDDFT and highlight the scope for further service development across the region. For example, in commissioning at software to streamline, process audit data using a web-based portal, accessible to all parties and extending nurse presence across 7 days due to the delayed times for weekend and evening transfers. Additionally, we were encouraged that our prevalent patients, usually dialysis recipients, experienced the shortest wait.
EFFECT OF ALLOPURINOL VERSUS SALINE HYDRATION IN PREVENTING CONTRAST-INDUCED NEPHROPATHY

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BACKGROUND AND AIMS: Contrast-induced nephropathy (CIN) is a generally reversible form of acute kidney injury that occurs soon after the administration of radiocontrast media. Several therapies are being used for the prevention of CIN. We aimed to gather the data about protective role of a single oral dose of Allopurinol along with hydration with normal saline as compared with normal saline only in our settings.

METHOD: Duration of study was 6 months. It was done at Department of Nephrology/Cardiology, Pakistan Institute of Medical Sciences (PIMS), SZABMU, Islamabad.

In this randomized controlled trial, a total of 76 (n = 76) adult (age 18–75 years) patients of either gender who were planned to undergo coronary intervention were selected for this study. All the enrolled patients had an eGFR <60 mL/min. Participants were divided into two groups randomly by using random number tables. Patients in group A received a single dose of 300 mg Allopurinol orally 12 h before contrast-based procedure and intravenous normal saline hydration at the rate of 0.5 mL/kg/h in continuous infusion 12 h before and 12 h after contrast-based procedure. Group B received normal saline hydration alone in dose equal to group A. Blood samples were drawn 12 h before procedure. Samples were analyzed for serum creatinine levels. Blood samples were drawn after 48 h and 5 days of procedure for serum creatinine analysis. CIN was assessed in all patients, which was defined as an absolute increase in serum creatinine level of > 0.05 mg/dL or a relative increase of > 25% from baseline at 48 h after contrast exposure and compared in both treatment groups.

RESULTS: Gender distribution was similar in both groups with M:F of 1.71 in group A and 1.53 in group B (P = 0.813). Mean age was 57.6 years ± 7.4 SD in group A, while it was 58.4 years ± 6.5 SD in group B (P = 0.612). There were 63.2% (n = 24/38) patients in group A who were between ≤60 years of age and 36.8% (n = 14/38) had an age >60 years. Mean eGFR at baseline in group A was 53.7 mL/min ± 4.7 SD, and it was 54.8 mL/min/1.73 m² ± 3.8 SD in group B (P = 0.277). Mean maximal allowable contrast dose (MACD) in group A was 323.3 mL ± 51.7 SD, and it was 313.4 mL ± 0.09 SD in group B (P = 0.445). Mean contrast volume was 55.1 mL ± 5.9 SD in group A, and it was 56.9 mL ± 5.6 SD in group B (P = 0.171). The mean CV/MACD ratio was similar in both groups (0.17 versus 0.19, P = 0.160, Table 7). Contrast-induced nephropathy (CIN) was observed in 5.3% (n = 3/58) patients in group A, while it was observed in 71.4% (n = 26/36) patients in group B (P = 0.013). Efficacy of a single dose of Allopurinol along with hydration with normal saline was significantly better in patients with raised serum uric acid levels at baseline when compared with normal saline only (P = 0.013). No other significant difference noted across all groups (P>0.05 in all cases).

CONCLUSION: CIN developed in a significantly lesser number of patients who received a single dose of 30 mg of Allopurinol 12 h before administration of contrast along with saline hydration as compared with patients receiving hydration alone.

THE EFFECT AND MECHANISM OF RENAL TARGETED DELIVERY OF MSC EXOSOMES IN THE TREATMENT OF AKI

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BACKGROUND AND AIMS: AKI occurs in ~15% hospitalized patients and over 50% intensive care unit patients. However, effective therapeutic strategies for AKI are urgently needed. The exosomes derived from mesenchymal stem cells (MSC-exos) have achieved great focus as a cell-free therapy. As foremost metabolic organs, MSC-exos mainly collect in the liver and spleen. More attention should be considered how to induce more exosomes targeted to the injured kidney. In addition, the potential role of MSC-exos in injured kidney and the underlying mechanisms still need further research.

METHOD: Transmission electron microscopy, western blotting and nanoparticle tracking analysis were used to identify the properties of human umbilical cord mesenchymal stem cells (hucMSCs) derived exosomes. Kidney targeting peptide was chosen by the IVIS spectrum imaging system. Moreover, kidney targeting peptide (peptide-CGA) and CD63 targeting peptide were loaded to the MSC-exos by co-incubated (CGA-exos). Flow cytometry and immunofluorescence staining were utilized to confirm this. IVIS spectrum imaging system was used to assess MSC-exos distribution in vivo.

RESULTS: In vivo imaging showed that Peptide-CGA was efficiently homing to the ischemic kidney and predominantly accumulated in proximal tubules. Further Immunoprecipitation study showed that Peptide- CGA treatment group produced a specific stripe in silver staining compared with other groups. CGA-exos was successfully constructed. MSC-exos could alleviate murine ischemic kidney injury and reduced the renal tubules injury. Furthermore, in vivo imaging showed CGA-exos treatment group could attract more MSC-exos into the injured kidney, and its therapeutic effect was significantly better than that of the MSC-exos treatment group without causing significant organ side effects.

CONCLUSION: Novel kidney targeting MSC-exos was constructed. It exhibited a preferential tendency to injured kidney and was localized to proximal tubules in AKI. We demonstrate that MSC-exos ameliorate ischemic AKI. But its further mechanisms

FIGURE 1: Median Time Between Acceptance and Arrival Based on Time of Patient Transfer.