

Peri-operative hyperkalaemia in deceased-donor kidney transplant recipients

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Background:

Hyperkalaemia is a common and life-threatening medical emergency present in up to 10% of acute hospital admissions. End-stage Kidney Disease (ESKD) patients undergoing transplantation are at increased risk of hyperkalaemia and although the prevalence of hyperkalaemia in ESKD is well described, few studies have assessed the incidence and treatment of hyperkalaemia in kidney transplant recipients. Here, we describe the results from a retrospective review of peri-operative hyperkalaemia in incident deceased-donor kidney transplant recipients.

Methods:

We conducted a retrospective electronic health record review of 172 consecutive deceased-donor kidney recipients at Addenbrooke's Hospital, Cambridge between November 2018 and November 2019. Patients receiving simultaneous pancreas/kidney transplants, simultaneous liver/kidney or multi-visceral transplants were excluded as were living-donor kidney recipients. Variables abstracted included demographics, the type of organ received, pre-transplant renal replacement modality, treatments received for hyperkalaemia, serum potassium values and admission and discharge dates.

Data were summarised as frequency (%), mean \pm standard deviation (SD) or median with interquartile range (IQR) as appropriate. Categorical variables were compared by Chi-squared test and continuous variables by Student's t-test or Mann-Whitney U-test based on their distribution.

Results:

172 patients received a deceased-donor kidney during the study period and the median age of all recipients was 56 (IQR 46-64.5) years. 110 (64%) patients received a DCD (donation after circulatory death) kidney with the remaining 62 (36%) receiving DBD (donation after brainstem death) kidneys. 110 (64%) of recipients received haemodialysis prior to transplant. Mean serum potassium prior to transplant was 4.22 ± 0.61 mmol/L and immediately post-operatively was 4.69 ± 0.61 mmol/L.

85 (49%) recipients required emergency treatment for hyperkalaemia post-operatively. The median serum potassium prior to treatment was 5.98 mmol/L (IQR 5.7-6.2) with median time to treatment of 6.8 hours (IQR 2.4-9.6) after kidney reperfusion. Of these patients 64% underwent emergency haemodialysis as the first line treatment for hyperkalaemia, whilst 24 of the 31 patients treated with insulin/dextrose for hyperkalaemia went on to receive haemodialysis for hyperkalaemia. Median length of stay was longer in those receiving treatment for hyperkalaemia (9 days (7-13) vs 7 days (6-10), $p=0.005$). Additional data is described in the table below.

Conclusion:

Hyperkalaemia amongst kidney transplant recipients is common, particularly in the peri-operative period. Current management strategies contribute to morbidity, with haemodialysis in the first week also independently associated with increased healthcare costs per patient in the first year following transplantation. New oral potassium binders may offer an alternative or adjunct to current management

but there is a lack of data for their use in transplant patients. Clinical trials in the transplant peri-operative setting are warranted.