Service Evaluation to describe fluid assessment characteristics in patients with stage-3 Acute Kidney Injury (AKI) requiring dialysis

Introduction

Acute Kidney Injury is characterised by sudden loss of renal function with numerous clinical causes. Kidney hypoperfusion and volume depletion of the systemic circulation is the most common cause of AKI (36.5%) (1). Whereas established AKI with oliguria may lead to fluid accumulation and potential for peripheral and pulmonary oedema. It has been repeatedly demonstrated that there is a link between fluid overload and mortality, as well as increased morbidity and length of stay (2). The impact of robust fluid assessment including the use of bioimpedance in patients with stage-3 AKI is not well researched.

Methods:

A service evaluation (SE) was undertaken to evaluate the routine fluid assessment performed in stage-3 AKI patients requiring dialysis in a single centre with a large renal population. A case report file was produced, and data collated from multiple data sources. Prospective and retrospective data was collected from the January to June 2019. Descriptive statistics were used to analyse the data. Exclusions include advanced Chronic Kidney Disease (CKD) and critical care admission prior to starting Haemodialysis (HD).

Results:

Twenty patients were included in the study. 70% (n=14) were male with overall average age of 72 (SD=11) years old. Most common comorbidities in these patients are hypertension (45%), Type 2 diabetes (55%) and cancer (45%). Nine patients (45%) were described as fluid overloaded and 9 patients as dry/dehydrated on admission via a clinical assessment (falling to five at initiation of HD). The most common cited causes of AKI were sepsis, dehydration/hypovolaemia and medication. These individual and combined factors contributed to the development of AKI (8 patients).

Six months post-admission, four patients (20%) were considered CKD and considered end-stage renal disease. Mean age was 68 (SD=10) with Charlson comorbidity index, suggesting a likely 2% survival at 10 years. Ten patients were alive and not on HD (50%), mean age was 77 (SD=11) with an estimated 2% survival at 10 years. Six patients died (30%) within 3-months of initiating HD (5-88 days) (mean age 67, SD=10) and an estimated survival of 53% at 10years. Mean NEWS2 score at time of HD was low, at 1 (SD=1). Six patients were readmitted within 30 days. Mean length of stay 22 days (SD=20).
Discussion

This service evaluation provides a snapshot of patient characteristics and fluid assessment of patients with stage-3 AKI requiring HD. The findings are comparable to other studies with mortality cited for stage-3 being at 33.3%(3). Renal replacement therapy is slightly higher than in other literature 14%(4). The lack of sensitivity of NEWS2 score for patients with AKI is supported by Faisal, Scally (5), who stated that NEWS has little role in the escalation of patients with AKI. Compounded with the younger age of the patients who died and their greater estimated chance of survival, further exploration is required to identify a more robust method of identifying deterioration in this group.

Conclusion

There is evidence to suggest that NEWS2 is not useful at detecting deterioration in patients with stage-3 AKI. Further exploration is required to determine if robust fluid assessment could improve management in these patients.

![NEWS2 score of patients with stage-3 AKI requiring dialysis](image)

**NEWS2 score at initiation of haemodialysis in patients with stage-3 AKI requiring dialysis**

References