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Effect of Modification of the Continuous Renal Replacement Regime in QEH ICU

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Introduction

Acute Kidney injury (AKI) is common among Intensive Care Unit (ICU) patients and up to 8% of the admitted patient required renal replacement therapy. The optimal dose of Continuous renal replacement therapy (CRRT) was re-defined after the two large randomized control trials to an effluent flow rate of ≥ 25 mL/kg per hour. Besides, in the recent KDIGO (Kidney Disease Improving Global Outcomes) Clinical Practice Guideline, Regional citrate anticoagulation (RCA) was recommended in patients with no contraindication for citrate. Our ICU had revised our CRRT regime according the latest scientific evidence. We conducted a retrospective study to review the impact of the changes made.

Objectives

CRRT with pre-dilution method (label as conventional) is the main modality of CRRT in our unit. In this regimen, we used the Haemosol B0 solution as replacement solution at fixed rate of 2600ml/h. (600ml/h as pre-dilution and 2000 ml/h as post-replacement) Starting from August 2015, we changed to a body-weight adjusted regime at the effluent rate of 25ml/h according to three groups of body weight; namely the 40-50 kg; 51-70 kg & 71-90 kg.

Citrate-based CRRT was re-introduced in 2010 with the use of the commercially prepared citrate containing solution. Modification of the regime had been done to simplify its use and we currently have two different RCA regimes to suit the different need of the patients.

Methodology

Our ICU is a 21-beds mixed bed ICU in a tertiary hospital. We included all the patients admitted to the ICU from 1st Jul to 31st Dec 2016 who required CRRT. The following data were collected, the CRRT regime, the dosage of the CRRT used; the total run time; the round-up number of replacement solution used; the ICU and hospital outcome of these patients. We also included the monthly expenditure on CRRT solution which acted as surrogate for the consumption rate of the CRRT solution.

Result

Total of 418 treatment sessions from 109 patients were analysed. 335 treatment

sessions (80.1%) were conventional and 83 (19.9%) were citrate-based CRRT. The total run time were 9861 hours with 6801 hours for conventional and 3060 hours for citrate-based CRRT. The average CRRT circuit run-time per session for conventional and citrate-based CRRT was 20.3 and 36.9 hours respectively.

By calculating the difference in amount of replacement solution used between the new and the old regime, the projected half yearly expenditure decreased from \$682,952 to \$555,246. The overall ICU and hospital mortality of these groups of patients were 34.8% & 47.7% respectively.

The monthly expenditure on Haemosol B0 solution one year before and one year after the changes made in Sep 2015 decreased from 6449 bags to 5480 bags; while the overall consumption of the citrate-based solution increase by 4%.

In conclusion, modification of the CRRT regime will not affect patient outcome while increasing the cost effectiveness of this treatment modality.