Influence of Mean Arterial Pressure on the reasons for RRT termination and in-hospital mortality

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Introduction

Mean arterial pressure (MAP) at the initiation of continuous renal replacement therapy (CRRT) may influence the decision for CRRT termination, which may in turn be a strong risk factor for in-hospital mortality.

Methods and Materials

This prospective cohort study collected data for CRRT patients seen at the Third Affiliated Hospital from January 2016 to December 2020. We collected MAP data at the initiation of CRRT, reasons for CRRT termination, and in-hospital mortality data. We divided the patients into four groups based on quartiles of the initial MAP and used Cox proportional hazard models to determine the effects of initial MAP on the decision for CRRT termination and in-hospital mortality.

Results I

 A total of 2,346 patients with acute kidney injury (AKI) were included in this study. The median age of the participants was 68.0 (57.0–76.0) years, and 68% were male. The cut-offs for the MAP quartile were as follows: first (Q1), ≤ 69; second (Q2), 69.1–77.7; third, 77.8–89.0; and fourth (Q4), ≥ 89.1 mmHg. Renal recovery (36.8%) and death (36.6%) were the most common causes of CRRT termination, followed by the transition to hemodialysis (13.1%), a do-not-resuscitate (DNR) order (7.2%), unstable blood pressure (BP) (3.8%), and transfer to another nursing care facility (1.2%).
 The risk of "unfavorable reasons" for CRRT termination (death, DNR order, unstable BP) was higher in Q1 (hazard ratio [HR] 1.312 (1.032–1.669)) and Q2 (HR 1.306 (1.027–1.662)) compared in Q4.
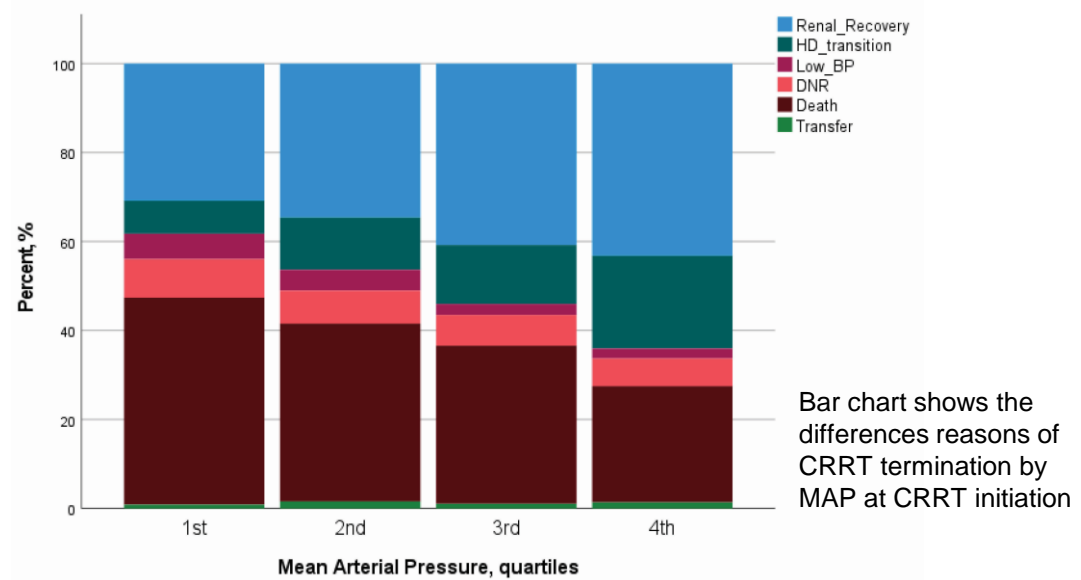
Bar chart shows the differences reasons of CRRT termination by MAP at CRRT initiation

Results II

During the median hospital stay of 16 (interquartile range: 4, 37) days, 54.6% of the patients died. Multivariate analysis indicated that unfavorable reasons for CRRT termination strongly affected in-hospital mortality (HR 18.558 (14.086–24.451)) whereas the MAP quartiles at CRRT initiation did not.
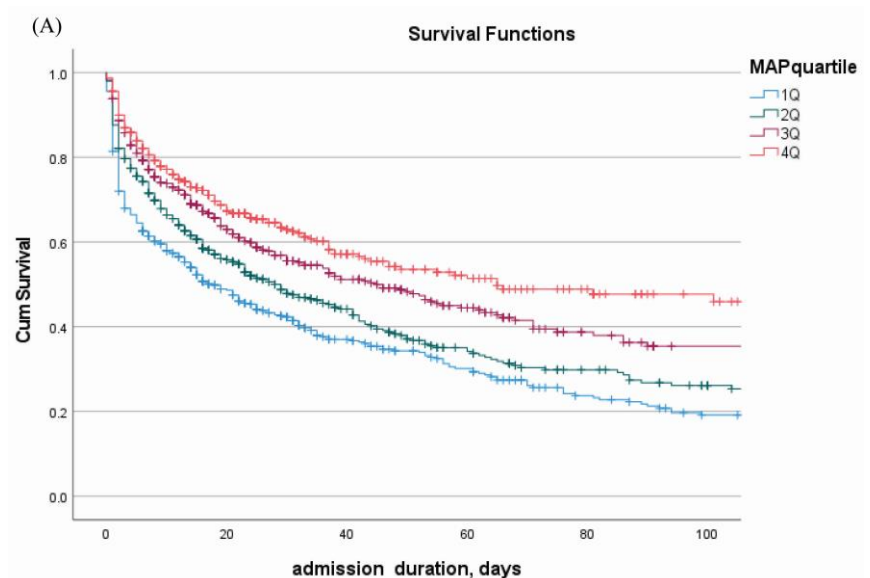

Figure (A) Kaplan Meier survival curve shows the differences in in-hospital mortality by MAP at CRRT initiation

Conclusions

A lower MAP at CRRT initiation was closely associated with a higher probability of terminating CRRT due to death, a DNR order, or unstable BP, and these reasons were strongly associated with in-hospital mortality.