THE RELATIVE PREDICTIVE ABILITY OF FOUR DIFFERENT MEASURES OF HEMODIALYSIS DOSE

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ABSTRACT

Background: The amount of hemodialysis patients receive is an independent predictor of mortality. However, the relative predictive ability of four common measures of dialysis dose (URR, spKt/V, dpKt/V, Kt) is unclear.

Methods: Using The Renal Network Data System (TRNDS), we identified all 14810 incident hemodialysis patients in Indiana, Kentucky, Ohio, and Illinois from 1997-2000. We calculated each measure of hemodialysis dose over the first 6 months of treatment, and then prospectively followed the patients for an additional 6 months. For each measure of dialysis dose, we developed a logistic regression model to examine the relationship between dose and patient mortality after adjusting for age, race, sex, cause of renal failure, comorbid conditions, and albumin. We compared the predictive ability of the four models using the c statistic, a measure of how frequently survivors have a lower predicted probability of death compared to nonsurvivors. C statistics can vary from 0.50 (no predictive ability) to 1.00 (perfect predictive ability). We also compared the models using calibration curves.

Results: Of all patients, 11.3% died during follow-up. Mortality was independently associated with low dialysis dose, advanced age, white race, female gender, specific comorbid conditions, and low albumin. All four predictive models had virtually identical c statistics (range 0.68-0.69) and calibration curves.

Conclusions: Models including hemodialysis dose and patient characteristics have a modest ability to predict mortality. Moreover, all four measure of dialysis dose have an equivalent predictive ability. Decisions to utilize a specific measure should be based on other considerations such as ease of use, need to troubleshoot inadequate dialysis delivery, or research on urea kinetics or nutritional factors.