Short Communication

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Predicting Hospital Cost in Ckd Patients through Blood Chemistry Values

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Abstract

Background

Controversy exists in predicting costly hospitalization in patients with chronic kidney disease and co-morbid conditions. We therefore tested associations between serum chemistry values and the occurrence of in-patient ho spital costs over a thirteen month study period. Secondarily, we derived a linear combination of variables to estimate probability of such occurrences in any patient.

Method

We calculated parsimonious values for select variables associated with in-patient hospitalization and compared sensitivity and specificity of these models to ordinal staging of renal disease.Data from 1104 de-identified patients which included 18 blood chemistry observations along with complete claims data for all medical expenses. We employed multivariable logistic regression for serum chemistry values significantly associated with in-patient hospital costs exceeding $3,000 in any single month and contrasted those results to other models by ROC area curves.

Results

The linear combination of weighted Z scores for parathyroid hormone, phosphorus, and albumin correlated with in-patient hospital care at $p < 0.005$. ROC curves derived from weighted variables of age, eGFR, hemoglobin, albumin, creatinine, and alanine aminotransferase demonstrated significance over models based on non-weighted Z scores for those same variables or CKD stage alone. In contrast, the linear combination of weighted PTH, PO4 and albumin demonstrated better prediction, but not significance over non-weighted Z scores for PTH alone.

Conclusion

Further study is justified to explore indices that predict costly hospitalization. Such metrics could assist Accountable Care Organizations in evaluating risk adjusted compensation for providers.