ABSTRACT

Chronic kidney disease (CKD) is becoming a dreadful disease by increasing at alarming rate every year, world widely. Globally, incidence of treated End Stage Renal Disease is rising at annual growth rate of 8% and one of ten individuals is suffering from some stage of chronic kidney disease. The annual mortality rate in haemodialysis patients fluctuates within 10% to 25% globally and it is a critical health issue of Pakistan. In this study, combine prognostic influence of demographic and Biochemical variables are investigated, to determine the best and worst prognosis for survival of dialysis patients. Variety of survival methods including non parametric, semi parametric and parametric techniques on the questionnaire based collected data have been used in this research. Significant prognostic factors were derived by fitting a Cox Model in both univariate and multivariate analysis. After checking the adequacy of fitted Cox Model the prediction model has been obtained with interactions of prognostic factors at low, medium and high levels. Hazard Ratios confirmed the overall survival benefit at high level of serum albumin, high hemoglobin, low or medium inter dialytic weight gain and low or medium potassium simultaneously reduces hazard rate by 99.34%. Combined effect of low level of serum albumin and hemoglobin, high level of inter dialytic weight gain and potassium proved to be more hazardous for concerned population. Complete set of interactions of main prognostic factors presented to be more beneficial to provide insight to clinicians for better survival of dialysis population.

Prognosis is an elementary component in practice of medicine and is often used to guide patients about the diagnostic track of treatment. Literally prognosis means prediction, forecasting, estimation of the probability or risk of an individual's expected upcoming health outcomes, for instance complication, illness or death. Since establishing the prognosis of dialysis patients is very important part of their evaluation and treatment. Multiple factors of demographic and biochemistry variables such as, age, gender, race, body mass index, albumin, hemoglobin, creatinine, potassium, sodium, cholesterol, calcium and pre dialysis blood pressure have been reported as vital prognostic factors for dialysis population having end stage renal disease. Previously several attempts have been made to construct a prognostic model including these factors, but all prognostic models for patients undergoing dialysis were poorly reported with flawed model development methodologies. Adequately reported studies with necessary information to assess the model performance and possible bias, adequate sample size, prognostic ability and model reproducibility are mandatory to establish reliable prognostic models for long-term outcomes. In present research, derivation data set was used to build a prognostic model for overall survival of dialysis population and external validation of that model was evaluated by another independent data set. The current validated prognostic model can be used to compute expected survival probabilities for different populations of patients. Cox regression was

applied to establish the present prognostic model for overall survival in 758 dialysis patients. The model included current age, inter dialytic weight gain, serum potassium, hemoglobin, serum albumin and duration of dialysis significant prognostic factors ($P < 0.05$) with respect to death. Moreover, there were significant interaction effects between weight and hemoglobin ($P = 0.009$), weight and albumin ($P = 0.035$), albumin and potassium ($P = 0.008$), and albumin and hemoglobin ($P = 0.000$). Measures of predictive performance specified that the model is well calibrated so it has ability to construct unbiased estimates of outcome, and contains good discrimination abilities, consequently facilitating plausible prognosis for individual patients.