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Classification models to predict survival of kidney transplant recipients using two intelligent techniques of data mining and logistic regression

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Kidney transplantation is the treatment of choice for patients with end-stage renal disease (ESRD). Prediction of the transplant survival is of paramount importance. The objective of this study was to develop a model for predicting survival in kidney transplant recipients. In a cross-sectional study, 717 patients with ESRD admitted to Nemazee Hospital during 2008-2012 for renal transplantation were studied and the transplant survival was predicted for 5 years. The multilayer perceptron of artificial neural networks (MLP-ANN), logistic regression (LR), Support Vector Machine (SVM) and evaluation tools were used to verify the determinant models of the predictions and determine the independent predictors. The accuracy, area under curve (AUC), sensitivity and specificity of SVM, MLP-ANN and LR models were 90.4%, 86.5%, 98.2% and 49.6%; 85.9%, 76.9%, 97.3% and 26.1% and 84.7%, 77.4%, 97.5% and 17.4%, respectively. Meanwhile, the independent predictors were discharge time creatinine level, recipient age, donor age, donor blood group, cause of ESRD, recipient hypertension after transplantation, and duration of dialysis before transplantation. SVM and MLP-ANN models could efficiently be used for determining survival prediction in kidney transplant recipients.

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