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Prediction of stages of diabetic nephropathy based on data mining technique

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Objectives: Diabetic nephropathy (DN) is one of critical condition which is connected with higher mortality and morbidity and also affects the other organs with high risk i.e. CVS. Early diagnosis and symptoms are regarded as crucial factors in the therapy and regulation of said diseases. Data mining technique or machine learning algorithms is an efficient tool to predict, classify and extract out the veiled data from patient (laboratory or clinical). In this study we predict, classify, and filter the information of patient clinical and laboratory data via data mining algorithms to assist the doctors in analyzing the severity of diseases with accuracy.

Methods: To find out the hidden information of patient data, we work on four commonly utilized algorithms i..e Multilayer Perceptron (MLP), Radial Basis Function (RBF), Support Vector Machine (SVM) and Probabilistic Neural Networks (PNN). We also compare these entire algorithms which provide us an excellent classification finding, to predict the diabetic nephropathy phases on the basis of laboratory and clinical value.

Results: All applied algorithms such as Multilayer Perceptron (MLP), Radial Basis Function (RBF), Support Vector Machine (SVM) and Neural Networks (PNN) were compared. The finding indicates that Probabilistic Neural Networks provides with higher percentage (95.2) of accuracy in overall classification in respect to all used data mining algorithms to classify the diabetic nephropathy stages. While the Multilayer Perceptron used execution time very low about 4s an PNN need 13s to complete the classify process. All used algorithms with the accuracy in classification were compared on the basis of DN classified stages in patients; times need for model construction and model testing.

Conclusions: The present finding reveals that the Probabilistic Neural Networks algorithm shows an excellent classification with accuracy and performance of prediction to measure the severity of DN stages in patients.