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PREDICTION OF CHRONIC KIDNEY DISEASE -USING MACHINE LEARNING

S Mary Rexcy Asha[a], Sanjhana Dinesh[b], Thrisha R J[c], Vidhya V[d], Swetha K[e]
rexcyasha@gmail.com[a] sanjudecuty@gmail.com[b] thrishasdhu@gmail.com[c] vidhyadharsan15@gmail.com[d]
<swethakannan2801@gmail.com>[e]
[abcde]Department Of Information Technology,Panimalar Engineering College, Tamil nadu 600123

Abstract: Now a days technological development including machine learning, plays an enormous role on health and prediction of diseases. Kidney disease is a vital chronic disease related with ageing, diabetes, people with hypertension and people ageing 60 and above. Diagnosis of CKD is commonly tending to spread, costly, laborious and risky. CKD results in loss of kidney function little by little. The circumstances can be noticed above a period of years or months. Machine learning represents one ocular network has been put in on the same dataset. The aim is to construct a live application by machine learning techniques KNN algorithms and Naïve bayes.

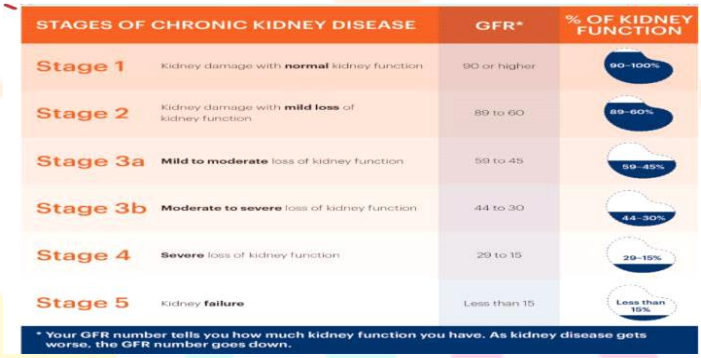
Keywords: CKD, EGFR, URINALYSIS

I. INTRODUCTION

The 10th huge disease that leads to death in the worldwide is CKD. If CKD is predicted at premature stage, then it is possible to rescue kidney function. The main function of kidney is to strain excess water from blood to elicit urine, if affected by CKD, the excess water is not abstracted and urine is not produced. The symptoms of chronic kidney diseases are Nausea, nosebleeds, vomiting, abdominal pain, loss of appetite and sleep problems.

EGFR:

The cleaning of blood in kidney is shown by eGFR value. If eGFR value is more than 90 it is considered the kidney is normal, if its below 60, this indicates that your affected by CKD.



STAGES OF CHRONIC KIDNEY DISEASE		GFR*	% OF KIDNEY FUNCTION
Stage 1	Kidney damage with **normal** kidney function	90 or higher	90-100%
Stage 2	Kidney damage with **mild loss** of kidney function	89 to 60	89-60%
Stage 3a	**Mild to moderate** loss of kidney function	59 to 45	59-45%
Stage 3b	**Moderate to severe** loss of kidney function	44 to 30	44-30%
Stage 4	**Severe** loss of kidney function	29 to 15	29-15%
Stage 5	Kidney **failure**	Less than 15	Less than 15%

* Your GFR number tells you how much kidney function you have. As kidney disease gets worse, the GFR number goes down.

Figure 1: EGFR

URINALYSIS:

Mostly doctors prefers for urine test ,to check the kidneys function because the presence of blood and protein in kidney indicates that your kidney is not functioning correctly.

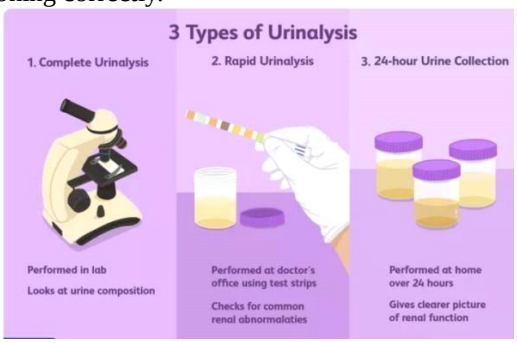


Figure 2: URINALYSIS

BLOOD PRESSURE:

The pressure of pumping blood in heart is blood pressure. If eGFR below 15 indicates the last stage of CKD. The therapy for CKD is kidney transplantation and dialysis. Diagnosing CKD commonly begin in clinical, lab and in the end biopsy.

II.LITERATURE SURVEY

Classification technique is divided the data into two types of data sets 1) Training set 2) testing sets. The training set accommodate one quary variable and some attributes.

Random Forest (RF) is a classification technique used for tree prediction. The data mining techniques are classification, prediction, Artificial Neural network (ANN) Classifier Method, Outlier Detection, clustering, Genetic algorithm etc. The Naïve bayes generate more exact results when compared to ANN. Also, the machine learning algorithms like support vector machine(SVM), Decision Tree, Generalized Linear Models, Bayesian classification, Classification by Backpropagation, K-NN Classifier, Rule-Based Classification, Frequent- Pattern Based Classification, Rough set theory, Fuzzy Logic. SVM gives the highest correct with filtered subset evaluator.

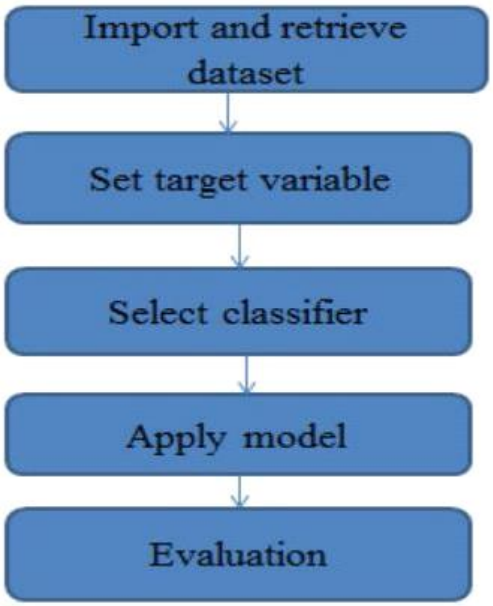


Figure 3: LITERATURE SURVEY

III.PROPOSED METHODOLOGY

The main purpose of this study is to probe machine learning techniques in amalgamation with feature selection techniques for fruitful CKD detection. The study proposes various prediction models using classification algorithms with different techniques offered by the WEKA tool and compares them for correctly classified instances. The identified classification technique can provide predicted values for early CKD diagnosis.

Chronic kidney disease (CKD) has become a global health issue and is an area of concern. It is a condition where kidneys become damaged and cannot filter toxic wastes in the body. The proposed system predominantly focuses on predicting this life-threatening disease Chronic Kidney Disease (CKD) using Classification algorithms (KNN and Naive Bayes).

Proposed system is automation for chronic kidney disease prediction using classification techniques and supervised learning algorithms.

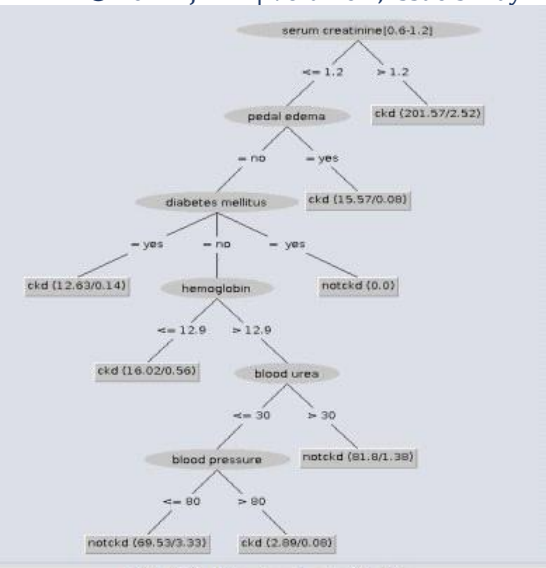


Figure 4: PROPOSED METHODOLOGY

IV.DATASET

The proposed method makes use of the Chronic Kidney Disease dataset from the UCI Machine Learning Repository, which comprises 25 attributes, 11 of which are numeric and 14 of which are textual nominal. The dataset has 400 cases in total, which are used for the analysis.There are 250 prediction algorithms that have been trained, and 250 of them have been labelled non-chronic kidney disease (CKD) and chronic kidney disease (CKD) renal failure (NOTCKD). The dataset's attributes are as follows: age, bp, sg, al, su, bc, pc, pcc, ba, bgr, bu, sc, sod, pot, hemo, bc, pc, pcc, ba, bgr, bu, sc, sod, pot, hemo, bc, pcc, ba, bgr, bu, sc pcr, wc, rc, htn, dm, cad, appet, pe, ane, classification pcr, wc, rc, htn, dm, cad, appet, pe, ane, classification .The dataset is separated into two groups: one for training and the other for testing another for testing purposes. The training-to-testing data ratio is 70 percent of the time and 30% of the time, respectively.

V.RESULT

For classification, the application employs KNN algorithms. The application includes an Admin module, which is used to manage the application. After successfully logging in, the administrator can add doctors and receptionists. The receptionist will enter the previous patient's training dataset and register the new patient.

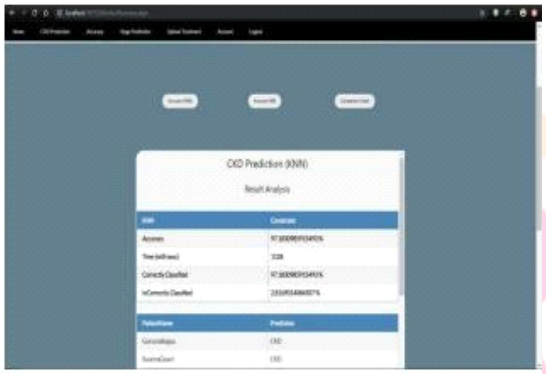


Figure 5: RESULT

If a patient has CKD, the doctor can assess the stage of the disease and whether or not the patient has it. Doctors can also upload treatment information for a specific patient. By logging onto the application, the patient can see his treatment details.

VI.CONCLUSION

This project is a healthcare application that aids medical practitioners in predicting CKD disease based on CKD characteristics. It is a type of automation for predicting CKD disease, and it diagnoses the disease and its stages in a timely and cost-effective manner. It is done successfully using the KNN algorithms for classification. Data mining technology encompasses this classification approach. This programme accepts CKD factors as input and uses data from previous CKD patients to forecast the disease.

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