**AN EARLY DETECTION OF CHRONIC KIDNEY DISEASE USING MACHINE LEARNING**

**LITERATURE SURVEY**

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**LITERATURE SURVEY**

**Survey 1:**

**T.Di Noia (2013)**

**An end stage kidney disease predictor based on an artificial neural networks.**

In 2013, T. Di Noia, presented a software tool that used the artificial neural network ANN to classify patient status, which is likely to lead to end-stage renal disease (ESRD). The classifiers were trained using the data collected at the University of Bari over a 38-year period, and the evaluation was done based on precision, recall, and F-measure. The presented software tool has been made available as both an Android mobile application and online web application.

**Survey 2:**

**H.S.Chase (2014)**

**Chronic kidney disease- related to metabolic complications predictions.**

In 2014, H. S. Chase identified two groups of patients in stage 3: 117 progressor patients (eGFR declined >3 ml/min/1.73m2 /year) and 364 non-progressor patients (eGFR declined <1 m1/min/1.73m2). Where GFR is a glomerular filtration rate that commonly used to detect CKD. Based on initial lab data recorded, the authors used Naïve Bayes and Logistic Regression classifiers to develop a predictive model for progression from stage 3 to stage 4. They compared the metabolic complications between the two groups and found that phosphate values were significantly higher, but bicarbonate, hemoglobin, calcium, and albumin values were significantly lower in progressors compared to non-progressors, even if initial eGFR values were similar. Finally, they found that the probability of progression in patients classified as progressors was 81% (73% − 86%) and non-progressors was 17%(13%-23%).

**Survey 3:**

**K.A.Padmanaban and G.Parthiban (2016)**

**Applying machine learning techniques for predicting the risk of chronic kidney disease.**

In 2016, K. A. Padmanaban and G. Parthiban, aimed in their work to detect chronic kidney disease for diabetic patients using machine learning methods. In their research, they used 600 clinical records collected from a leading Chennai based diabetes research center. The authors have tested the dataset using the decision tree and Naïve Bayes methods for classification using the WEKA tool. They concluded that the decision tree algorithm outweighs the Naïve Bayes with an accuracy of 91%.

**Survey 4:**

**A.Salekin and j.Stankovic (2016)**

**Detection of chronic kidney disease and selecting important predictive attributes.**

In 2016 ,A. Salekin and J. Stankovic , evaluated three classifiers: random forest, K-nearest neighbors, and neural network to detect the CKD. They used a dataset with 400 patients form UCI with 24 attributes. By using the wrapper method, a feature reduction analysis has been performed to find the attributes that detect this disease with high accuracy. By considering: albumin, specific gravity, diabetes mellitus, hemoglobin, and hypertension as features, they can predict the CKD with .98 F1 and 0.11 RMSE.

**Survey 5:**

**W.Gunarathne, K.Perera, and K.Kahandawaarachchi (2017)**

**Evaluation on machine learning classification techniques for disease classification and forecasting through data analytics for chronic kidney disease.**

In the study carried out by W. Gunarathne, K. Perera, and K. Kahandawaarachchi, Microsoft Azore has been used to predict the patient status of CKD. By considering 14 attributes out of 25, they compared four different algorithms, which were Multiclass Decision Forest, Multiclass Decision Jungle, Multiclass Decision Regression, and Multiclass Neural Network. After comparison, they found that Multiclass Decision Forest performed the best with 99.1% accuracy.

**Survey 6:**

**J.Xiao (2019)**

**Comparison and development of machine learning tools in prediction of CKD progression**

Lastly in 2019, J. Xiao in their study established and compared nine ML models, including LR, Elastic Net, ridge regression lasso regression SVM, RF, XGBoost, k-nearest neighbor and neural network to predict the progression of CKD. They used available clinical features from 551 CKD follow-up patients. They conclude that linear models have the overall predictive power with an average AUC above 0.87 and precision above 0.8 and 0.8, respectively

**REFERENCE**

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