# A STUDY ON HYPERTENSIVE DISORDERS IN PREGNANCY USING DATA MINING TECHNIQUES

Neethu Mathew

Department of Computer Science and Engineering, Jyothi Engineering College, Thrissur, (India)

# ABSTRACT

A high risk pregnancy is one that endangers the life or health of a mother or her infant. Hypertensive disorders are the most common cause of these pregnancy related complications. It's a major challenge in healthcare because they results in increasing maternal and foetal death. In the present era, various techniques in data mining are widely used for the early identification of health diseases .The main intent of this paper is to pinpoint the present complications of pregnant women by applying various classification algorithms for predicting hypertensive disorders. Using these techniques we can predict the risks and also can decrease maternal and foetal mortality.

Keywords: Pregnancy, Hypertensive Disorder, Data mining, Classification

### **I.INTRODUCTION**

Women who were normal and healthy before getting pregnant may experience some risk of problems. Having hypertension at any time can lead to problems but especially during gestation. It could have dangerous outcomes for mother and child, if adequate care is not taken to control it effectively. Hypertension is a leading cause of concern and its prevalence is increasing in developing countries. Therefore, getting early identification and regular pregnancy care can help to decrease the risk for problems before they become more serious.

Hypertensive disorders that complicating pregnancy can be classified into different groups like preeclampsiaeclampsia, gestational hypertension, chronic hypertension and preeclampsia superimposed on chronic hypertension. Preeclampsia is a condition that pregnant women develop with high blood pressure and proteinuria. This condition generally appears after the twentieth week of gestation. This may develop into the more severe state called eclampsia. Gestational hypertension is generally defined as having a BP greater than 140/90 mmHg in two different occasions at least six hours apart without protein in the urine. Hypertension diagnosed before pregnancy or before the twentieth week of gestation is called chronic hypertension. Rapid increase in excess protein in urine or blood pressure cause chronic hypertension with superimposed preeclampsia.

The exploration of a large dataset to extract hidden patterns is referred as data mining. Nowadays, data mining is becoming more popular in healthcare domain. But the medical data cannot be used without proper mining. There exist a lot of data mining techniques to predict various diseases. Here we discuss various data mining approaches that help to identify the disorders that affect pregnant women and they are mainly used for classification. Classification is a technique based on some criteria to classify the data into certain class. In classification the instances are given with labels that are known and each instance has a set of features. That is,

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they build a model from the training set and the resulting model is used to predict the class label of the testing instances. Decision tree induction and Bayesian classifier are some kind of classification methods used to determine the classifier of the sample.



#### Fig.1. Classification-diagram

## **II. LITERATURE SURVEY**

Here we describe various algorithms used in pregnancy care. In [1] they propose an inference mechanism that uses data mining technique. To classify the severity of disorder they compare two Bayesian classifiers named Naïve Bayes and AODE classifier. Naïve Bayes classifier is a supervised learning method. It's a probabilistic classifier based on Bayes theorem. The Bayesian formula can be written as:

$$P(H/D) = [P(D/H)*P(H)] / P(H)$$

The outcome of the event or the hypothesis H can be predicted based on the data D observed from the Bayes rule. The classifier finds the probability of hypertensive disorder. Here the set of attribute represent the risk factors. And each attribute occur in a particular hypertensive disorder. Each node represent that the symptom is independent. AODE is the averaged one dependence estimator classifier. It is an alternative for Naïve Bayes classifier. Each attribute in AODE structure has relationship with others. This method finds the probability of each class given a set of features. The result shows that minimizing the dependence of attributes reduces the accuracy.

Decision tree is a tree likes structure where each node represents a test on the value of attribute, each branch denotes the outcome of the test and leaf indicates a class or decision nodes. J48 is decision tree based classifier and it is an implementation of ID3 algorithm. J48 algorithm has large use in data mining and they provide best result in the decision tree methods that use a set of training data. In [2] they introduce a Naïve Bayes classifier and its performance is compared with a data mining classifier called J48 classifier. From the study the result

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shows that the tree based classifier has more accuracy than Naive Bayes classifier. But both classifiers are good predictors for decision making problems.

Diagnosis of the pregnancy disorder called preeclampsia can be done using the Bayesian network [3].Bayesian network has a significant role in healthcare and it is a probabilistic knowledge based system. They construct a system to support medical decision for pregnancy care. And this decision support system use probabilistic concept for decision making. In this model they use three network nodes-risk factors, physiological mechanisms and symptoms/exams. Hypertension and proteinuria nodes provide more contribution for decision making. The Bayesian Network can be defined by its structure and probabilistic model. They require more clinical data for better evaluation. Thus data mining contribute a way to improve decision making process.

### **III.CONCLUSION**

The objective of the work is to provide a general idea of data mining techniques that can be employed in pregnancy related hypertensive disorder prediction systems. This study can be done using different classification algorithms for examining their Attention problems. Data mining methods are essential in medical field for prediction. The area of data mining has been establishing itself as the major part of computer science and has shown significant potential for future improvements. As future work we can improve the performance and accuracy using other classification techniques and large datasets.

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