

Determination of effective factors on preeclampsia severity; the application of classification and regression trees

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Abstract

Background&Objective: Despite advances in medical sciences, preeclampsia and eclampsia are still among chief causes of maternal mortality worldwide. In this study, we used classification and regression trees to investigate the role of certain inherent and maternity care factors in severe preeclampsia.

Materials&Methods: This study was done on 1643 pregnant women admitted at 4 hospitals in Iran with one of the 53 maternity complaints were enrolled in this study during 2005. Variables of socioeconomic status, history of pregnancy and diseases, health care visits numbers awareness of warning signs, and the body mass index before pregnancy were recorded in the analysis model as predictors, and preeclampsia severity was entered as the dependent variable. A non-parametric method, known as the classification and regression tree was used to predict the studied consequence. Model validation was done using subsets of the study sample. The results were compared with logistic regression analysis.

Results: The incidence of preeclampsia among the studied patients was 5.2%. In model 1, variables of frequent headaches and epigastric pain during pregnancy, the number of previous pregnancies, and the amount of maternal care received were predictive of severe preeclampsia. In model 2, only frequent headaches and the number of previous pregnancies were found predictive. Sensitivity for model 1 and 2 was 47.8% and 39.1%, respectively, and specificity was 96.8% and 93.6%, respectively. In logistic regression analysis, only frequent headache was related to severe preeclampsia (OR=2.5, CI 95%: 1.3-5.0).

Conclusion: This study showed that using of variables that can be measured during maternity care visits to predict severe preeclampsia. Regarding the simple interpretation of tree models and their application in clinical decision making, which can be used in different levels of the health care system.

Key Words: Severe preeclampsia- Prediction- Classification and Regression tree- Validation