

A Predictive Model for the Diagnosis of Preeclampsia

Allahyari, Elahe (M.Sc.)¹; Rahimi Foroushani, Abbas (Ph.D.)^{1*}; Zeraati, Hojjat (Ph.D.)¹; Mohammad, Kazem (Ph.D.)¹; Taghizadeh, Ziba (M.Sc.)²

1. Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

2. Department of Midwifery, Faculty of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

Abstract

Introduction: Preeclampsia is one of the three main causes of death in pregnant women. The medical condition is identified by hypertension and proteinuria with serious effects on the health of mother and the fetus. There seems to be no precise methods to diagnose preeclampsia at its onset. This study was done to evaluate the simultaneous measurement of some variables thought to be responsible in the pathogenesis of preeclampsia for predicting or screening those at risk.

Materials and Methods: In this study, 466 primiparas were selected randomly among the bulk of pregnant women who attended Maryam Hospital for prenatal care in Tehran, Iran during 2007-2008. The subjects had no history of chronic health conditions and regularly took Iron supplements. The predictive variables included age, job, education, income, number of previous marriages, BMI during the first trimester of pregnancy, age at the time of recruitment for the study, changes in hematocrit concentration at the beginning and the 24th to 28th weeks of pregnancy, blood pressure and roll-over test during 28th to 32nd week of gestation but the onset of preeclampsia was considered as a dependent variable. For analyzing the overall effects of the mentioned variables on prediction of the disease, multivariate logistic regression analysis was employed and ROC curves were used for determining a suitable cut-off point for determining the sensitivity and specificity of the model.

Results: The prevalence of preeclampsia was 6.4% (95% CI: 4.2-8.6). Variables such as positive roll-over test, fulfillment of university education, marriage more than once, high blood pressure during the 24th-28th weeks of gestation, being a housekeeper, satisfaction with income, positive roll over test at a late stage of gestation and increase in BMI raised the risk of preeclampsia 8.61, 7.98, 2.65, 1.84, 1.56, 1.28, 1.21 and 1.11 times respectively. The proposed logistic regression model had a sensitivity of 83% and a specificity of 76% regarding the inclusion of all the mentioned variables.

Conclusion: Regarding the serious complications and negative effects of preeclampsia on both the mother and the fetus and the high sensitivity of this logistic regression model and imposition of no costs on the person for the measurement of the variables, this model seems to be suitable for the screening of preeclampsia.

Keywords: Blood pressure, Body mass index, Diagnosis, Logistic models, Predictive, Preeclampsia, Pregnancy complications, Risk factor.

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* Corresponding Author:
Dr. Abbas Rahimi
Foroushani, Department of
Epidemiology and
Biostatistics,
Faculty of Public Health,
Tehran University of
Medical Sciences,
Tehran, Iran.
E-mail:
rahimifo@tums.ac.ir

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