

Predicting mortality rate of preterm infants in neonatal intensive care unit using artificial neural network model(Article)

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Abstract

Background and purpose: Despite rapid progress in medical treatments and acute care technology during the past 30 years alongside increasing costs of medical care, the analysis of outcomes such as mortality risk have been a challenge in intensive care units. The purpose of this study was to predict the mortality rate of premature infants in neonatal intensive care unit (NICU) using artificial neural network model. Materials and methods: This study was performed using the medical records of 100 preterm infants (less than 37 weeks gestation) in Mashhad Qaem Hospital, Iran, during 2007-2010 applying MATLAB. Twenty one variables were used of which 80% were for artificial neural network training and 20 percent were for testing the designed model. To prevent the dispersion of information we used information classification code system and the codes were used to design and test the artificial neural network model. Results: Per 60 neurons and 20 replication optimum validity was obtained (95.2% in training and 94.56% in experimental stage). The replications were not continued more, since in this case the algorithm would have gone towards overtraining. Conclusion: This study introduced a method for establishing ANN models in estimating the probability of mortality in premature infants using 21 variables. This model may be used for prediction of many other consequences in NICU such as mechanical ventilation duration and complications such as abnormalities in neuroimaging, necrotizing enterocolitis and bronchopulmonary dysplasia.

Author keywords

Artificial neural network, Mortality, Neonatal intensive care unit, Preterm infant