Abstract

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Prediction of neurologic prognosis after spontaneous circulation in out-of-hospital cardiac arrest patients: Fast and Frugal Tree analysis.

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Objectives:
Prediction of neurological prognosis in out-of-hospital cardiac arrest (OHCA) patients remains difficult. We wanted to develop a simple decision rule to predict the neurologic outcome after the return of spontaneous circulation (ROSC) in OHCA patients using Fast and Frugal Tree (FFT) analysis.

Methods:
Prospective post-cardiac arrest registry including 3 hospitals were retrospectively analyzed. Among 532 patients in registry, 308 patients were enrolled after excluding 107 patients transferred from other hospitals, 88 patients with baseline cerebral performance category (CPC) 3 or 4, and 29 patients without Glasgow Coma Scale (GCS) data after ROSC. A good neurologic outcome was defined as having CPC 1 or 2 at hospital discharge. Variables used for FFT analysis included age, gender, witnessed cardiac arrest, bystander CPR, initial shockable rhythm, prehospital defibrillation, prehospital ROSC, no flow time, low flow time, prompt light reflex and GCS after ROSC. Enrolled patients were randomly split into a training set and a test set (154 patients in each set).

Results:
Among 308 patients enrolled, 75 (24.4%) patients had a good neurologic outcome. Prehospital ROSC (True = good), prompt light reflex after ROSC (False = bad) and age < 62 years old (True = good, False = bad) were selected for the nodes constructing decision tree. Sensitivity, specificity, and accuracy of the decision tree to predict a good neurologic outcome were 100% (37/37), 82.1% (96/117), and 86.4% (133/154) in a training set and 97.4% (37/38), 84.5% (98/116), and 87.7% (135/154) in a test set.

Conclusions:
A simple decision rule developed by FFT analysis can predict the neurologic outcome after ROSC in OHCA patients.