Predictive Factors of Abnormal Finding Detected by Computerized Tomography Scan of Brain among Medical Critically Ill Patients

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Background: Computerized tomography (CT) scan is an investigation of choice for diagnosis causes of acute neurological deterioration among medical critically ill patients; however, transferring patients to perform CT scan is associated with complications. Transferring only high suspicious case could avoid unnecessary transferring associated with complications.

Objective: To identify predictive factors for abnormal finding detection from CT scan of brain among medical critically patients developing acute neurological deterioration.

Methods: A retrospective chart review was conducted. We enrolled patients in medical intensive care unit, who developed acute alteration of consciousness or neurological deficit and underwent CT scan of brain from 2007 to 2017. The primary outcome was radiological confirmed acute onset hemorrhagic or ischemic stroke. Patient’s demographics data, neurological examination, and laboratory findings were recorded. To identify predictive factors of abnormal finding detected by CT scan, uni-variated and multi-variated analysis were performed.

Results: A total of 113 ICU patients were included. 17 (15.0%) developed hemorrhagic stroke and 35 (30.9%) developed ischemic stroke. Comparing to those with no abnormal neurological finding detected by CT scan, patients with hemorrhagic stroke were associated with significant higher blood pressure, low Glasgow coma scale, and PH ≥ 7.4. While, patients with ischemic stroke were associated with older age and PH ≥ 7.4. Multi-variated analysis identified abnormal pupil examination as an independent predictor of hemorrhagic stroke (relative risk, 26.86; 95% CI, 3.68-196.29; P = 0.001) and abnormal Babinski’s sign was an independent predictor of ischemic stroke (relative risk, 4.58; 95% CI, 1.14-18.49; P= 0.032).

Conclusion: In critically ill patients developing acute neurological deterioration, abnormal pupil examination can be a predictive factor of hemorrhagic stroke, while abnormal Babinski’s sign is a predictive factor of ischemic stroke.

Keywords: Stroke, Medical critically ill patients, ICU patient, CT brain