A NEW ALGORITHM TO SUPPORT DIAGNOSTIC PROCEEDINGS IN PATIENTS ADMITTED IN STROKE UNIT

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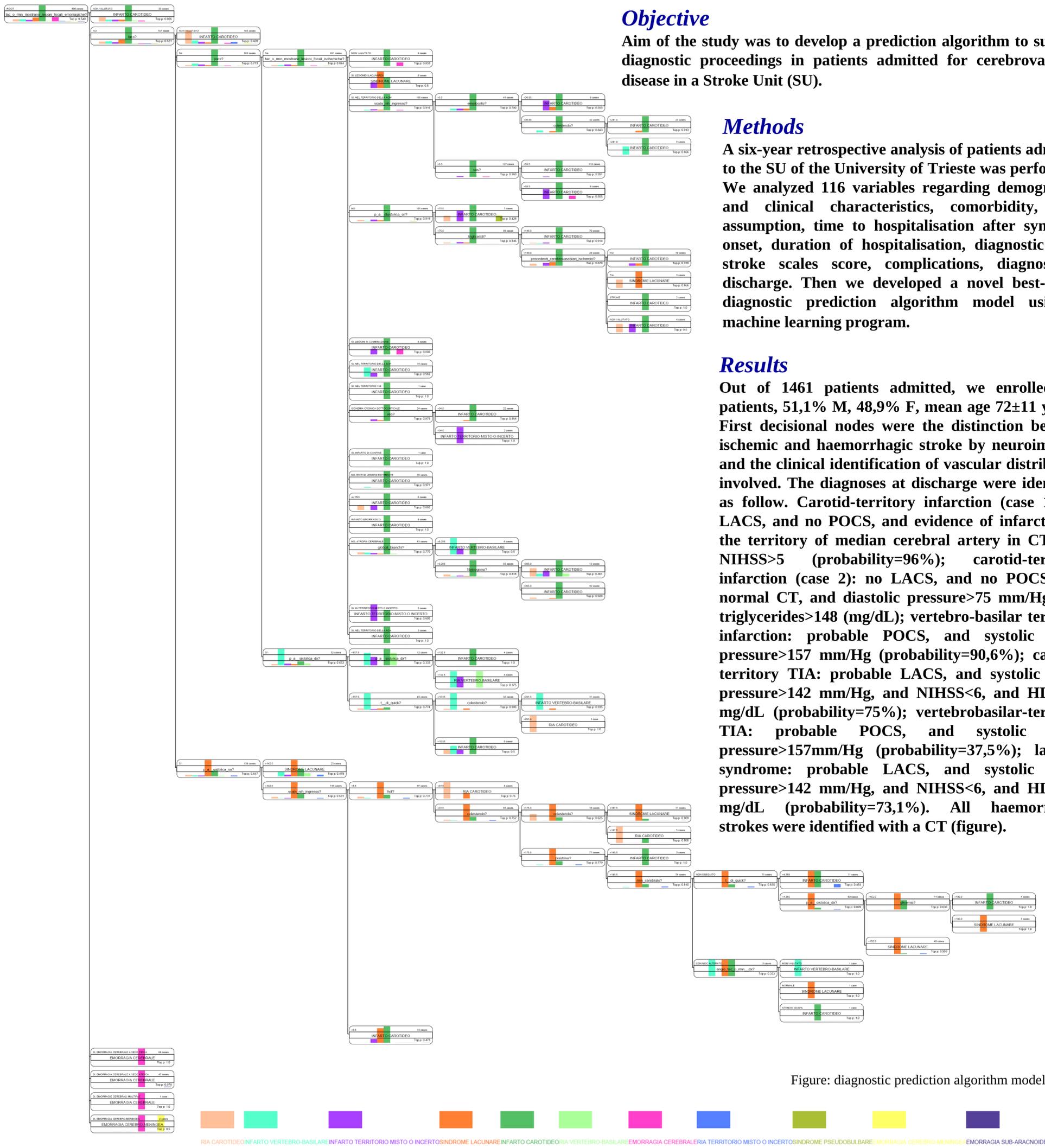[2] International School for Advanced Studies (SISSA) – Trieste

Objective

Aim of the study was to develop a prediction algorithm to support diagnostic proceedings in patients admitted for cerebrovascular disease in a Stroke Unit (SU).

Methods

A six-year retrospective analysis of patients admitted to the SU of the University of Trieste was performed. We analyzed 116 variables regarding demographic and clinical characteristics, comorbidity, drug assumption, time to hospitalisation after symptom onset, duration of hospitalisation, diagnostic tests, stroke scales score, complications, diagnosis at discharge. Then we developed a novel best-fitting diagnostic prediction algorithm model using a machine learning program.

Results

Out of 1461 patients admitted, we enrolled 896 patients, 51,1% M, 48,9% F, mean age 72±11 years. First decisional nodes were the distinction between ischemic and haemorrhagic stroke by neuroimaging and the clinical identification of vascular distribution involved. The diagnoses at discharge were identified as follow. Carotid-territory infarction (case 1): no LACS, and no POCS, and evidence of infarction in the territory of median cerebral artery in CT, and NIHSS>5 (probability=96%); carotid-territory infarction (case 2): no LACS, and no POCS, and normal CT, and diastolic pressure>75 mm/Hg, and triglycerides>148 (mg/dL); vertebro-basilar territory infarction: probable POCS, and systolic blood pressure>157 mm/Hg (probability=90,6%); carotid-territory TIA: probable LACS, and systolic blood pressure>142 mm/Hg, and NIHSS<6, and HDL<31 mg/dL (probability=75%); vertebrobasilar-territory TIA: probable POCS, and systolic blood pressure>157mm/Hg (probability=37,5%); lacunar syndrome: probable LACS, and systolic blood pressure>142 mm/Hg, and NIHSS<6, and HDL>31 mg/dL (probability=73,1%). All haemorrhagic strokes were identified with a CT (figure).

Figure: diagnostic prediction algorithm model

Conclusions

Main nodes of the algorithm reflected validated clinical diagnostic proceedings with very high predictive accuracy in all the patients enrolled. The proposed model could also identify other appropriate diagnostic procedures in adherence of national validated guidelines. A prospective application is ongoing.