212 CTBRAIN MACHINE LEARNING PREDICTS STROKE THROMBOLYSIS RESULT

Sarah Epton, Paul Bentley, Jeban Ganesalingam, Anomas Dias, Kate Mahady, Paul Rinne, Pankaj Sharma, Omid Halse, Amrish Mehta, Daniel Rueckert. *Imperial College London*

10.1136/jnnp-2014-309236.212

Objective To determine whether machine learning of acute stroke computerised tomography (CT) images helps predict Symptomatic Intracranial Haemorrhage (SICH), following treatment with intravenous thrombolysis (tPA).

Methods Clinical records and CT-scans of 116 acute ischaemic stroke patients treated with intravenous tPA were collected retrospectively, comprising 100 patients who subsequently improved, and 16 who developed SICH. The sample was split into training (n=106) and test sets (n=10), the latter of which contained one SICH-to-be subject every time, repeated with different combinations 1760 times. Raw CT-scans were spatially normalised and input into a Support Vector Machine (SVM), adjusted for clinical severity. Performance of the SVM was compared with validated prognostication tools (SEDAN and HAT scores), by assessing area under receiver operating characteristic curves (AUC), and success on 1/10 forced-choice tests.

Results AUC of the SVM (0.72) compared favourably with that of SEDAN and HAT scores (0.63–0.71). The SVM also identified 9/16 SICHs on forced-choice tests, as opposed to 1/4 using prognostic scores.

Conclusions This proof-of-concept study shows that machine learning methods applied to acute stroke CT-scans potentially offers automation, and improved performance in SICH prediction following thrombolysis. Larger-scale cohorts, and incorporation of CT perfusion/angiography data, should be tested with such methods.

J Neurol Neurosurg Psychiatry: first published as 10.1136/jnnp-2014-309236.212 on 9 September 2014. Downloaded from http://jnnp.bmj.com/ on March 21, 2026 by guest. Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.