Objective CT-perfusion (CTP) has revolutionised stroke care by improving diagnostic accuracy and expanding eligibility to acute therapies. Current thresholds for core and penumbra are derived from studies of anterior-circulation stroke. We examined the optimal CTP thresholds for acute posterior-circulation ischaemic stroke (PCS).

Methods Data were analysed from 331-patients diagnosed with a PCS enrolled in the International-stroke-perfusion-registry (INSPIRE). Thirty-nine-patients with baseline multimodal-CT with occlusion of a large posterior-circulation (PC) artery and follow up diffusion-weighted-MRI at 24–48 hours were included. Receiver-operating-curve analysis was used to determine the optimal perfusion parameter and thresholds. Linear regression was used for volume analysis. Analysis of the PC including subregions was performed.

Results Mean-transit-time (MTT) and delay-time (DT) were the leading parameters to characterise ischaemic penumbra (AUC=0.73). Optimal thresholds for penumbra were a DT>1 second and MTT>145%. DT also provided the best estimate of infarct core (AUC=0.74) with an optimal core-threshold at a DT>1.5 seconds. CTP was most accurate in the calcarine (Penumbra-AUC [DT>1 second]=0.75, Core-AUC [MTT>135%]=0.79) and cerebellar regions (Penumbra-AUC [DT>0.5 seconds]=0.65, Core-AUC [DT>1.5 seconds]=0.79). On volume analysis, MTT>160% demonstrated the smallest mean-volume difference (MVD) and good correlation between the penumbral-estimate and follow-up MRI (R2=0.71). MTT>170% resulted in the smallest MVD between the core-estimate and follow-up MRI, but with poor correlation (R2=0.11).

Conclusion CTP has significant diagnostic utility in PCS. Accuracy of CTP varies by brain region. Optimal thresholds to define penumbra were DT>1 second and MTT>145%. The optimal threshold for core was DT>1.5 seconds. However, CTP core volume estimates should be interpreted with caution.

2379 FUNCTIONAL BRAIN ACTIVITY IN PATIENTS WITH ANTI-N-METHYL-D-ASPARTATE RECEPTOR (ANTI-NMDA-R) ENCEPHALITIS REFLECT SYMPTOMS OF NEUROCOGNITIVE DECLINE

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Objectives To characterise functional brain activity reflecting neuropsychiatric disturbances in patients with anti-N-methyl-D-aspartate receptor (anti-NMDA-R) encephalitis.

Methods 12 anti-NMDA-R encephalitis patients and 19 age and gender matched control participants completed neuropsychological tests including Hopkins Verbal Learning Test, Digit Span test, logical memory subtests 1 and 2 from the Wechler Memory Scale, National Adult Reading Test of IQ, Stroop test, Trail making tests A&B, Verbal fluency, matrix reasoning and WAS-II Vocabulary subtest. Functional Magnetic Resonance Imaging (fMRI) of brain function was undertaken in each participant while undergoing the Shifting Response Set task.

Results Significant differences in neurocognitive function were observed, with decreased function in anti-NMDA-R encephalitis patients on tests of verbal fluency ($F[1,29]=6.7$, $p=0.15$) backwards digit span recall ($F[1,29]=4.9$, $p=0.035$), Hopkins verbal learning test ($F[1,29]=16.5$, $p<0.001$) matrix reasoning test ($F[1,29]=9.7$, $p=0.004$), vocabulary ($F[1,29]=16.8$, $p<0.001$), trail making test ($F[1,29]=9.0$, $p=0.006$) and logical memory ($F[1,29]=6.3$, $p=0.018$). Factor analysis revealed these neurocognitive tests loaded onto a single factor, providing one statistical measure quantifying deficits across these domains.

Functional brain responses during shifting response set differed significantly between anti-NMDA-R encephalitis patients and matched controls. Whereas controls reduced activity within the subgenual cingulate, ventrolateral and superior frontal prefrontal cortices, activity was increased within patients.

Neural responses in the right superior parietal cortex, mid anterior cingulate cortex and right ventrolateral cortex reflected generalised neurocognitive deficits (single factor) in patients, relative to controls.

Conclusions Our findings further understanding of neural changes within anti-NMDAR encephalitis, and identify cortical regions where altered function reflects the severity of neurocognitive deficits.

2277 DIAGNOSTIC UTILITY OF GOLD COAST CRITERIA IN AMYOTROPHIC LATERAL SCLEROSIS

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Objective The diagnosis of amyotrophic lateral sclerosis (ALS) remains problematic, with current diagnostic criteria (revised El Escorial [rEEC] and Awaji) being complex and prone to error. Consequently, the diagnostic utility of the recently proposed Gold Coast criteria was determined in ALS.

Methods We retrospectively reviewed 506 patients (302 males, 204 females) to compare the diagnostic accuracy of the Gold Coast criteria to that of the Awaji and rEEC criteria (defined by the proportion of patients categorized as definite, probable, or possible ALS) in accordance with standards of reporting of diagnostic accuracy criteria.

Results The sensitivity of Gold Coast criteria (92%, 95% confidence interval [CI] = 88.7–94.6%) was comparable to that of Awaji (90.3%, 95% CI = 86.69–93.2%) and rEEC (88.6, 95% CI = 84.8–91.7%) criteria. Additionally, the Gold Coast criteria sensitivity was maintained across different subgroups, defined by site of onset, disease duration, and functional disability. In atypical ALS phenotypes, the Gold Coast criteria exhibited greater sensitivity and specificity.

Interpretation The present study established the diagnostic utility of the Gold Coast criteria in ALS, with benefits evident in bulbar and limb onset disease patients, as well as atypical phenotypes. The Gold Coast criteria should be considered in clinical practice and therapeutic trials.