Title	Magnetic resonance spectroscopy demonstrates neuronal loss and altered glutamatergic neurotransmission in Alzheimer's Disease
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Haemorrhagic transformation of ischaemic stroke: risk factors and prognostic implication

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Background: Haemorrhagic transformation (HT) complicating ischaemic stroke is associated with significant morbidities and mortality. The clinical implications of HT have not been explored locally. This study aimed to determine the risk factors and clinical implications of HT complicating cerebral infarction in the Hong Kong Chinese population.

Methods: This was a retrospective case-control study of consecutive patients admitted to Queen Mary Hospital with acute ischaemic stroke (IS) between 1 January 2007 and 31 December 2011. HT was diagnosed with examination of repeated brain neuroimaging (computed tomography or magnetic resonance imaging) performed within 2 weeks of IS onset. Patients with IS without repeated neuroimaging within 2 weeks, and patients with transient ischaemic attack or intracranial haemorrhage were excluded. HT was classified according to the European-Australasian Acute Stroke Study (ECASS) II criteria. Poor clinical outcome was defined as mortality within 90 days or modified Rankin scale score >2 at completion of rehabilitation or around 90 days.

Results: Of 718 patients recruited, 66 (9.2%) received intravenous (IV) thrombolysis and 117 (16.3%) developed HT—HI1, 12 (1.7%); HI2, 3 (0.42%); PH1, 46 (6.4%); PH2, 54 (7.5%); PH at remote site, 2 (0.28%). HT was independently predicted by IV thrombolytic therapy (odds ratio [OR]=2.86; 95% confidence interval [CI], 1.58-5.18), cardioembolic stroke (3.65; 2.23-5.97) and prior warfarin use (2.85; 1.27-6.39). At 90 days, 138 (19.2%) patients died. At completion of rehabilitation or around 90 days, 462 (64.3%) had poor outcome. The 90-day and 5-year mortality rates were significantly increased in patients with PH2 (hazard ratio=1.86; 95% CI, 1.07-3.24 and 1.53, 1.01-2.30, respectively). Multivariate analysis showed PH2 to be an independent predictor of poor outcome (OR=2.14; 95% CI, 1.04-4.40).

Conclusion: IV thrombolytic therapy, cardioembolic stroke, and prior warfarin use were independent predictors of HT. PH2 was associated with increased risk of poor outcome at approximately 90 days and mortality at 5 years.

Magnetic resonance spectroscopy demonstrates neuronal loss and altered glutamatergic neurotransmission in Alzheimer's disease

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Background: The role of the anterior cingulate cortex (ACC) is involved in the default mode network during resting state, and is dysfunctional in ageing and Alzheimer's disease (AD). We used magnetic resonance spectroscopy (MRS) to study the biochemical and metabolite profile in patients with AD, and compared with cognitive-normal healthy controls (HC) with no cognitive complaints.

Methods: In a cross-sectional study, 12 age-matched HC and 11 AD patients underwent ^{1}H-MRS using ACC as the region of interest. We measured choline (Cho), creatine (Cr), N-acetyl-aspartate (NAA), myo-inositol (mI), and glutamate/glutamine complex (Glx), and quantified them using internal water as reference.

Results: Compared to HC, AD patients had significantly lower Cho (AD, 2.09 ± 0.52 mM; HC, 3.51 ± 0.78 mM; P<0.001), NAA (AD, 7.80 ± 2.52 mM; HC, 15.27 ± 2.90 mM; P<0.001), and Glx (AD, 6.74 ± 1.90 mM; HC, 17.45 ± 4.17 mM; P<0.001). However, Cr (AD, 18.05 ± 2.52 mM; HC, 16.66 ± 1.84 mM; P=0.185) and mI (AD, 12.00 ± 4.10 mM; HC, 8.82 ± 3.84 mM; P=0.089) showed no significant differences.

Conclusion: Our findings are consistent with current literature supporting the evidence of neuronal loss and altered glutamatergic neurotransmission in AD. MRS may be sensitive for studies of early AD, mild cognitive impairment, and subjective cognitive decline.