Childhood stroke: recent research & clinical guidelines

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Active research areas in childhood stroke

- Causation
- Recognition
- Outcomes
- Treatment
- Long-term needs
IPSS
(International Pediatric Stroke Study)

• International collaborative study
• 30 centres from N America, Europe, Australia, Asia, S America
• First dataset: 2003 – 2007, n>600
• Second dataset about to close
IPSS: take home messages (n approx. 600)

- M>F for AIS
- Arteriopathy most important risk factor for AIS
- Arteriopathy associated with antecedent infection
- Idiopathic AIS rare (<10%)
- Multiple risk factors common
- 3% mortality, 75% morbidity at time of discharge
Childhood AIS: economic impact

- Acute treatment costs approx $70 000 USD/child

- At 5y healthcare costs = $135 000 USD
  - Lo et al 2009, Perkins et al 2009
Ongoing IPSS sponsored projects

- VIPS – vasculopathy in paediatric stroke
- TIPS – thrombolysis in paediatric stroke
- Seizure study

- Dataset available for others to interrogate
Childhood arterial ischaemic stroke incidence, presenting features, and risk factors: a prospective population-based study

Andrew A Mallick, Vijaya Ganesan, Fenella J Kirkham, Penny Fallon, Tammy Hedderly, Tony McShane, Alasdair P Parker, Evangeline Wassmer, Elizabeth Wraige, Samir Amin, Hannah B Edwards, Kate Tilling, Finbar J O’Callaghan

Summary
Background Arterial ischaemic stroke is an important cause of acquired brain injury in children. Few prospective population-based studies of childhood arterial ischaemic stroke have been undertaken. We aimed to investigate the epidemiology and clinical features of childhood arterial ischaemic stroke in a population-based cohort.

Methods Children aged 29 days to less than 16 years with radiologically confirmed arterial ischaemic stroke occurring over a 1-year period (July 1, 2008, to June 30, 2009) residing in southern England (population denominator 5.99 million children) were eligible for inclusion. Cases were identified using several sources (paediatric neurologists and trainees, the British Paediatric Neurology Surveillance Unit, paediatricians, radiologists, physiotherapists, neurosurgeons, parents, and the Paediatric Intensive Care Audit Network). Cases were confirmed by personal examination of cases and case notes. Details of presenting features, risk factors, and investigations for risk factors were recorded by analysis of case notes. Capture-recapture analysis was used to estimate completeness of ascertainment.

Findings We identified 96 cases of arterial ischaemic stroke. The crude incidence of childhood arterial ischaemic stroke was 1.60 per 100 000 per year (95% CI 1.30–1.96). Capture-recapture analysis suggested that case ascertainment was 89% (95% CI 77–97) complete. The incidence of arterial ischaemic stroke was highest in children aged under 1 year (4.14 per 100 000 per year, 95% CI 2.36–6.72). There was no difference in the risk of arterial ischaemic stroke between sexes (crude incidence 1.60 per 100 000 per year [95% CI 1.18–2.12] for boys and 1.61 per 100 000 per year [1.18–2.14] for girls). Asian (relative risk 2.14, 95% CI 1.11–3.85; p=0.017) and black (2.28, 1.00–4.60; p=0.034) children were at higher risk of arterial ischaemic stroke than were white children. 82 (85%) children had focal features (most commonly hemiparesis) at presentation. Seizures were more common in younger children (≤1 year) and headache was more common in older children (>5 years; p<0.0001). At least one risk factor for childhood arterial ischaemic stroke was identified in 80 (83%) cases.
GOSH/ICH research

- Disease mechanisms:
  - Blood markers predicting recurrence
  - How chickenpox causes stroke
- Improving diagnostics
- Genetics
Moyamoya project

- National registry of children with MM
- Estimate frequency and impact
- Plan prospective research on impact & genetics
- Patient parent involvement
Other research

• Acute stroke recognition tool (Mark Mackay, Melbourne)

• European moyamoya consortium (May 2014)
Childhood stroke guidelines

- National guidelines published in 2004 by Royal College of Physicians
- Cover whole patient pathway from diagnosis to rehabilitation
- Childhood arterial ischaemic stroke >28 days
Childhood stroke guidelines

• Update to be supported by RCPCH
• Funding form Stroke Association
• Working group formed and scope defined
• ETA 2015