

## Stroke in Australian Children under 2-years of age

### BACKGROUND

Stroke is an acute vascular event causing focal interruption of blood supply to the brain. This can occur at any age including in a foetus. The incidence of stroke is high in the newborn period<sup>1</sup> and in adulthood. It is the third most common cause of adult mortality in Australia<sup>2,3</sup> though neonates survive stroke better than adults.

We are interested in studying all types of stroke in children up to 2 years of age diagnosed by radiological and or clinical examination irrespective of the timing of the cerebral insult and including all outcomes of stroke including death and disability. We are excluding children with intraventricular haemorrhage (IVH) and stroke following accidental head injury or following physical abuse.

Previous estimates suggest an incidence of perinatal stroke of approximately 0.25/1000 live births annually<sup>6</sup>, however, more recent studies estimate the incidence in preterm infants to be as high as 7 per 1000 live births annually<sup>7</sup>. The incidence of pediatric stroke in children aged <18 years is estimated at 1.2 to 13 cases per 100,000 children annually<sup>8,9</sup>. The true incidence is likely to be higher in more recent studies with the availability of advanced diffusion-weighted (dw) magnetic resonance (MR) imaging<sup>4,5</sup>, especially in the case of hyper acute and acute stroke.

The most common clinical presentation of stroke is focal seizures. Perinatal stroke may be associated with nonspecific symptoms such as poor feeding, cyanosis, unexplained tachypnoea or apnoea<sup>10</sup>. Some children may present later in infancy with signs of motor deficit or cerebral palsy<sup>11</sup>. The diagnosis of stroke is by radiological imaging including brain MRI or CT, by the General Movements assessment<sup>12</sup> or neurological examination.

There is a gap in the epidemiological information regarding perinatal stroke in Australia as currently there is no national stroke registry for children. Some Australian centres have collaborated to contribute to the International Paediatric Stroke Study Group (IPSSG) registry<sup>13</sup>.

This study will improve our understanding of childhood stroke and assist in ascertaining its incidence in Australia. Most importantly, through this surveillance study we aim to establish the need for a 'national stroke register for children under 2-years of age' which is currently lacking.

This study will help to identify high-risk groups and to inform development of preventive measures. It will also raise awareness of neonatal stroke among Australian paediatricians and the importance of neurodevelopmental assessment for an early and accurate diagnosis and/or early intervention therapies.

### STUDY OBJECTIVES

1. To determine the incidence of stroke in Australian children < 2 years of age
2. To describe the epidemiology of stroke in the same population
3. To describe high risk groups that could be targeted for prevention strategies
4. To raise awareness among clinicians of the need to perform detailed neurodevelopmental assessments and imaging to support early diagnosis and intervention

*Please see over for Case Definition*

## CASE DEFINITION [4,5]

Please report any child < 2 years of age, diagnosed with cerebral stroke by radiological and/or clinical examination, irrespective of timing of insult and including all outcomes of stroke i.e. death and disability.

### Exclusion

Please exclude children with intraventricular haemorrhage and stroke following accidental head injury or following physical abuse.

## REPORTING INSTRUCTIONS

1. Please report any child newly diagnosed with cerebral stroke that meets the case definition above, whom you have seen within the last month and that you have not previously reported to APSU.

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