

# Childhood stroke study identifies the contraceptive pill and smoking as risk factors

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Researchers are calling for clear guidelines on childhood stroke after a study, published in the November issue of *Acta Paediatrica*, found wide variations in time lag to diagnosis, investigation and treatment.

They are also keen to see the development of appropriate rehabilitation services, after a follow-up study found that 85% of the children who survived a stroke had neurological dysfunction or limitations.

Dr Sten Christerson studied the records of all children who had experienced their first stroke over a seven-year period in the Uppsala-Orebro Health Care Region, which covers a fifth of the Swedish population.

He found that [risk factors](#) included the combined effects of oral contraceptives plus smoking or anaemia and that having a stroke had a significant effect on most of the children's everyday lives and performance and impacted on the whole family.

"The aim of the study was to evaluate the incidence, presenting symptoms and signs, time lag to diagnosis, medical investigations, risk factors and short-term outcomes of [childhood stroke](#)" says Dr Christerson from the Centre for Rehabilitation Research and the Paediatric Clinic at Orebro University Hospital. A second paper in the journal, also co-authored with Dr Bo Stromberg, charts the long-term outcomes of the children the researchers identified during the initial study.

"Childhood stroke is defined as a cerebrovascular event occurring between 28 days and 18 years of age" explains Dr Christerson. "Studies in Europe and the United States have found that childhood stroke affects between 2.1 to 13 children per 100,000 a year and we found an incidence of 1.8. Although childhood stroke is not as common as many other childhood illnesses, it is a serious condition that results in considerable long-term ill health and severe functional disabilities."

Fifty-one children - 23 boys and 28 girls - were identified from the records and 46 of the 47 children who survived were followed up 1.6 to 8.6 years later (median: 4.2 years) to determine the long-term effects of their stroke. The researchers were unable to trace one patient and four had died, two during the acute stage and two later.

Key findings from the initial study included:

- 51% had suffered an arterial ischaemic stroke (AIS), 41% had had a nontraumatic haemorrhagic stroke (HS) and 8% had experienced a sinus venous stroke. The age at first stroke ranged from seven months to just under 18 and the median age was 13 years.
- One third of the children had chronic underlying diseases and one-third had vascular malformations. The other third had acquired risk factors such as acute infections, anaemia, inflamed blood vessels after chicken pox and neck trauma. This category also included six girls who used oral contraceptives, like an estimated 40% of Swedish women aged 15 to 19. Three of these were also smokers and two also had iron deficient anaemia.

The total time lag to diagnosis was long and treatment varied:

- Less than a third of the children (31%) were diagnosed within six hours, because of delays by the patient, parents or doctor. Patients were more than twice as likely to go over six hours if they had AIS rather than HS, as the symptoms in the latter are often more distinct and alarming.
- There were also wide variations in the diagnostic tests carried out on the children and the treatment given to them, for example whether they were prescribed anticoagulants.

Ongoing health problems were very common:

- 85% of the surviving children had some acquired impairment. 65% had neurological impairment, which was moderate in 24% of cases and severe in 15%. The most common impairment (43%) was paralysis down half of their body. 64% had deficits that affected their school activity and participation and this was moderate in 21% of cases and severe in 17%.
- The children's health-related quality of life was significantly lower when compared with healthy children and more than half of the parents reported that their children had difficulties, or were incapable of, performing everyday functions. These included: learning, communication, mobility, personal care, interacting with other people and home life.

"Stroke in children is a serious condition that results in considerable long-term ill health and severe functional disabilities" concludes Dr Christerson. "In our study 8% of the children died and 85% of the survivors were left with neurological dysfunctions or limitations.

"Clear guidelines are needed to provide more consistent diagnosis and

treatment of childhood stroke and our study also highlights the need for long-term rehabilitation services. It also raises real concerns about young girls who take oral contraceptives and also smoke or have iron deficient anaemia. We feel that it is important to check anaemia levels before prescribing [oral contraceptives](#), prescribing iron tablets as required, and stress the risks that smoking poses."

**More information:** You can read the two papers free online at:  
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