

Cerebral palsy may have family ties

By Kelly Lenox

Researchers from NIEHS and Norway reported elevated risk of cerebral palsy (CP) for people born into families in which someone has been diagnosed with CP. In a [study](http://www.ncbi.nlm.nih.gov/pubmed/25028249) (<http://www.ncbi.nlm.nih.gov/pubmed/25028249>) published July 15 in the journal *BMJ*, scientists used the Medical Birth Registry of Norway, and other national data resources, to examine family patterns in the recurrence of CP. These patterns may, in turn, point to genetic or shared environmental causes of CP.

The researchers analyzed a cohort of more than two million Norwegians, born between 1967 and 2002, for CP risk among first, second, and third degree relatives. First degree relatives are full siblings; second degree are half siblings, aunts, and uncles; and third degree are first cousins.

According to the authors, other studies have suggested a familial risk for CP, but none has considered the full range of relationships within a single population, including full and half siblings.

Linked Video

[Watch Allen Wilcox, M.D. h.D., discuss how the environment affects fertility, pregnancy, and childhood development. \(04:54\)](#)

High-quality resource yields surprising results

"The national registries in Norway provide an incredible resource for studying family patterns of risk," said [Allen Wilcox, M.D., Ph.D.](#), head of the NIEHS Reproductive Epidemiology Group and one of the study's authors. "We were particularly surprised to see the gradient of cerebral palsy risk - highest for twins, and decreasing as the family relation became more distant, even out to first cousins. This pattern suggests there are important family-related causes of CP still waiting to be discovered."

In a *BMJ* [editorial](#)

(<http://www.ncbi.nlm.nih.gov/pubmed/25026893>)

published the same day, Peter Rosenbaum, Ph.D., professor of pediatrics and Canada Research Chair in Childhood Disability at McMaster University in Ontario, characterized the study as excellent. "The Norwegian study suggests that genes, a shared early familial environment, or perhaps both, are important contributors to overall risk, although many other as yet unidentified causative factors remain," he wrote. "Epidemiological studies such as the one by [first author Mette] Tollanes and colleagues are the cornerstone of research into the causes of cerebral palsy."

Increased risk for closer relatives

Researchers found a fifteenfold increased risk among twins when one had CP, a ninefold increase among younger full siblings if an older sibling had CP, and a threefold risk among half siblings. Remarkably, the study also found a weak association among first cousins.

Babies who subsequently develop CP often had difficult deliveries. For many years, CP was regarded as the result of anoxia, or a lack of oxygen, during delivery. More recently, CP has been suggested to be a condition that precedes delivery and may, in fact, be the cause of difficult delivery, rather than the result. Results from the Norwegian data support the idea that CP has more complex causes that precede birth.

[Dale Sandler, Ph.D.](#), head of the NIEHS Epidemiology Branch, agrees. "While many of us have thought that cerebral palsy was a mechanical problem at birth, it is actually more than that - and genetic, biologic, and possibly environmental factors may play a role," she said.

Citation Tollanes MC, Wilcox AJ, Lie RT, Møster D.

(<http://www.ncbi.nlm.nih.gov/pubmed/25028249>)

2014. Familial risk of cerebral palsy: population based cohort study. *BMJ* 349:g4294.

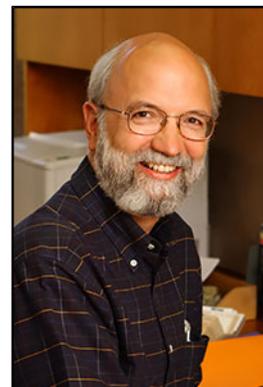
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(<http://www.ncbi.nlm.nih.gov/pubmed/25026893>)

2014. What causes cerebral palsy? *BMJ* 349:g4514.



Tollanes, who is currently a postdoctoral fellow at the University of Bergen in Norway, is due to join NIEHS in August as a guest researcher in the Epidemiology Branch. (Photo courtesy of Mette Tollanes)



The Wilcox group works to extend the study of environmental exposures to the area of human reproduction. Wilcox has a long-standing collaboration with colleagues at the University of Bergen and within the Norwegian public health community. (Photo courtesy of Steve McCaw)

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