

Cerebral Palsy & Maternal Infections

Lack of oxygen during labor and delivery is often blamed for cerebral palsy, a lifelong disability affecting the brain's control of muscles and movement. However, this study from the California Birth Defects Monitoring Program shows that in many cases, cerebral palsy may be linked to an infection in the mother—a preexisting condition—rather than problems arising during the birth process.

INFECTION RAISES RISK BY 9 TIMES

We compared medical records from the births of 46 children with unexplained cerebral palsy with those of 378 unaffected children. All had normal birthweight.

Infections of the uterus and/or urinary tract—diagnosed or suspected in about 3% of women in labor—greatly increased risk. Children were 9 times as likely to develop cerebral palsy if their mothers had:

- Chorioamnionitis, an infection of the uterus
- Bladder or kidney infection
- Sepsis, a generalized infection of the bloodstream
- Fever of more than 100.4°F or 38°C during labor
- Foul-smelling amniotic fluid
- Inflammation of the placenta/umbilical cord.

In most cases of infection, the amniotic membrane ruptured less than 24 hours before delivery. There was not enough information to determine whether antibiotic treatment or C-section delivery altered

the risk of cerebral palsy in children whose mothers had signs of infection. We didn't look at infections during other points in pregnancy or study other types of illness, such as sore throats, pneumonia, or viral infections.

INFECTIONS A FACTOR IN MANY CASES

About 60% of cerebral palsy occurs in children with normal birthweight. Urinary/reproductive tract infections may account for as much as 12% of cerebral palsy in this group.

CEREBRAL PALSY FACTS

In cerebral palsy, the brain does not properly control muscles and movement. Some people with cerebral palsy have additional disabilities, such as mental retardation or seizures.

- Moderate to severe cerebral palsy—one of the most common childhood disabilities—is found in 1 to 2 in 1000 children, affecting more than 700 children born each year in California.
- The lifetime cost of medical and other care for a person with cerebral palsy averages more than \$500,000.
- The causes of brain damage in cerebral palsy are mostly unknown. Very low birthweight is one risk factor, but about 60% of children with cerebral palsy had normal weight at birth.

Infection was even more strongly linked to spastic quadriplegia, a form of cerebral palsy with abnormal muscle control in all 4 limbs. About 40% of children with cerebral palsy have this subtype; infections may account for as much as 35%.

SYMPTOMS MIMIC LACK OF OXYGEN

About 90% of children with cerebral palsy born to mothers with infection had medical problems as newborns—needing breathing assistance in the delivery room or medication to maintain blood pressure, developing seizures, or having neurologic problems. While these newborn symptoms are often attributed to lack of oxygen during labor, they may be caused by underlying infections.

The most dramatic association was with Apgar scores, a 10-point rating system to assess infant well-being immediately after delivery. About half the babies with low Apgar scores—whether or not they later developed cerebral palsy—had mothers with signs of infection. Low Apgar scores alone do not predict cerebral palsy, but babies with low scores whose mothers had infections were at very high risk.

MEDICAL IMPLICATIONS

- A pregnant woman with signs of infection should contact her health care provider immediately.
- Because we don't yet know when or how infections may damage babies' brains, we don't know whether antibiotic treatment at delivery will help. As with any medication, the potential risks and benefits must be weighed.
- Among babies born to mothers with infection, those who developed cerebral palsy usually showed problems as newborns.

AVENUES FOR FURTHER STUDY

Understanding more about infections and their role in cerebral palsy opens the door to possible prevention. Many points still need clarifying, however. We must learn more about which infections may cause cerebral palsy, as well as the best ways to identify and treat them.

DATA SOURCES

As part of an ongoing study to discover risk factors, we identified 192 children 3 years or older with moderate to severe cerebral palsy. These were drawn from more than 155,000 births in 1983-85 to women who lived in 4 California counties: San Francisco, Santa Clara, San Mateo, and Contra Costa.

This segment of the study looked at children with normal birthweight (>2500 grams, 5.5 pounds) and no other explanation for their cerebral palsy. We documented symptoms of infection and other medical problems from the delivery and newborn records of these 46 children with cerebral palsy and a randomly selected comparison group of 378 unaffected children.

REFERENCE: Grether JK, Nelson KB. Maternal infection and cerebral palsy in infants of normal birthweight. Journal of the American Medical Association 1997;278:207-211.

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