Underlying cause of cerebral palsy could lie in family links

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Babies born into families in which someone has cerebral palsy are at an increased risk of having the condition, suggests a paper published in the *BMJ* today.

This is the first study to investigate cerebral palsy over such a broad range of family relationships.

Cerebral palsy is the most common cause of physical disability in children, affecting approximately two in 1,000 live births in the developed world (and many more elsewhere). It originates from damage to the 'immature' brain and several risk factors in pregnancy have been identified such as preterm delivery, abnormal growth, exposure to infection and lack of oxygen at birth.

Previous studies have found a possible family link with cerebral palsy, but positive findings have been hard to replicate. So researchers from Norway set out to investigate recurrence of cerebral palsy among twins and first, second, and third degree relatives to shed light on patterns of inheritance.

The study involved 1,991,625 single births and 45,116 twins born in Norway between 1967 and 2002.

Using national registries and linkages among families, they identified 3,649 cases of cerebral palsy among two million births. The prevalence of cerebral palsy was 1.8 per 1,000 for children born during 1967-2002.

The rate was higher in twins (5.1 per 1,000) than in singletons (1.7 per 1,000).

The highest risk was seen in co-twins of affected children. If one twin had cerebral palsy, the relative risk of recurrence of cerebral palsy was 15 times higher in the other twin.

In families with an affected single child, there was a six to ninefold increased risk in a subsequent full sibling (first degree relatives) and up to a threefold increased risk in a half sibling (second degree relatives).

These increased risks were independent of sex and persisted after excluding preterm births (an important risk factor for cerebral palsy).

Affected parents carried a 6.5 times increased risk of having an affected child compared with unaffected parents. However, for people with an affected first cousin (third degree relatives), only weak evidence existed for an increased (1.5-fold) risk.

"Our data suggest that cerebral palsy includes a genetic component, with a stronger recurrence among relatives with closer genetic relationship," say the researchers, and that the underlying causes of the condition "extend beyond the clinical management of delivery."

However, they suggest that genetic influences are only part of a wide range of causes, and that future studies "should consider the possibility of genetic causes as well as genetic susceptibility to environmental causes."

In an accompanying editorial, leading paediatrician Professor Peter Rosenbaum says parents rightly want to know why their child has serious neurological impairments, whether something they did caused their child's problems, and whether the same problems may recur in later

children or grandchildren.

He acknowledges that the search for the causes of cerebral palsy is "far from over" but points out that even family members with a 15-fold increase in risk of recurrence have a small absolute risk of cerebral palsy. "This information should provide some reassurance to families in which cerebral palsy is already present," he concludes.

More information: www.bmj.com/cgi/doi/10.1136/bmj.g4294
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