Obstetrics and gynaecology

Identifying risk factors for cerebral palsy

A population-based case control study from Sweden has identified different potential risk factors for the subtypes of cerebral palsy.

A total of 356 cases of cerebral palsy were identified in children, aged four years or older, born at term, during the period 1983-1994, in Sweden. Of these, 47 cases were excluded, because of postnatal causes of cerebral palsy and spinal malformation. This included 25 children with ataxic cerebral palsy as this condition can be difficult to differentiate from non-cerebral palsy syndromes.

The remaining 309 cases were included in the study. Two matched controls were selected for each case. Cerebral palsy was classified as dyskinetic or spastic. Spastic cerebral palsy was subdivided into hemiplegic, diplegic and tetraplegic cerebral palsy.

Case records were scrutinised and data associated with maternal history (e.g. maternal smoking and alcohol consumption, pre-eclampsia, hypertension and gestational diabetes), obstetric catastrophe (e.g. ruptured uterus, prolapsed cord, placental abruption) and postpartum neonatal encephalopathy were extracted. Encephalopathy was deemed present if the baby had neonatal seizures or any of the following lasting > 24 hours: altered consciousness; breathing or feeding difficulties; abnormal tone or reflexes.

Demographic and other data, such as results of antenatal ultrasound scanning were also collected.

Significant factors associated with cerebral palsy included obstetric catastrophe, low birthweight and meconium staining of liquor. Emergency caesarean section, an Apgar score < 7 at 5 minutes and neonatal encephalopathy were very strongly associated with cerebral palsy.

Birthweight, not living with the baby's father, admission to NICU, maternal weight and neonatal encephalopathy appeared to be risk factors for cerebral palsy in general, see table 1, below.

When sub-types of cerebral palsy were analysed in a multivariate analysis, see table 2, below, spastic diplegia and tetraplegia were most associated with gestational diabetes, mother not living with baby's father, emergency caesarean section and admission to NICU.

For spastic hemiplegia small head circumference and admission to NICU were the strongest associations.

A low Apgar score and admission to NICU were most associated with dyskinetic cerebral palsy which, unlike the spastic forms of cerebral palsy, was associated only with intrapartum and postnatal factors.

The authors were unable to identify a single risk factor that was pre-eminent. Rather they observed a mix of antenatal, intrapartum and postnatal factors which differed according to cerebral palsy subtype.

The authors conclude that the risk factors identified may be useful indicators for identifying children at risk of developing cerebral palsy and help to target individuals for early intervention programmes.

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● **Ahlin K, Himmelmann K, Hagberg G et al. Non-infectious risk factors for different types of cerebral palsy in term-born babies: a population-based, case-control study. *BJOG* 2013;120:724-731**

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Table 1

Risk factors for cerebral palsy in term infants (multivariate analysis)

Risk factors	Odds ratio	95% Confidence interval
Birthweight	0.54	0.4-0.7
Not living with the baby's father	2.58	1.1-6.0
Admission to NICU	4.43	3.0-6.5
Maternal weight at 34 weeks gestation	1.02	1.0-1.03
Neonatal encephalopathy	69.22	9.4-511.9

Table 2

Risk factors for spastic diplegia and tetraplegia (multivariate analysis)

Risk factors	Odds ratio	95% Confidence interval
Gestational diabetes	13.13	1.2-135.30
Not living with the baby's father	5.69	1.54-21.00
Birth length	0.83	0.7-0.9
Emergency caesarean section	19.72	2.27-171.7
Admission to NICU	3.18	1.7-6.0