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CHANGE IN CEREBRAL PALSY INCIDENCE AND SEVERITY AMONG CHILDREN BORN PRETERM IN 1990-2005: A HOSPITAL-BASED COHORT STUDY

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Background: Cerebral palsy (CP) is a neurodevelopmental condition that can be well-recognized from early childhood onward.

Aims: To examine CP incidence, severity and associated factors among 2960 preterm survivors of a level III neonatal intensive care unit, born 1990-2005.

Methods: Inclusion criteria: gestational age < 34wks and admission < 4 days after birth. Sixteen potentially relevant factors were analyzed. The cohort was divided in period I: 1990-1993 n=661; II: 1994-1997 n=726; III: 1998-2001 n=723 and IV: 2002-2005 n=850. The Gross Motor Function Classification System (GMFCS) was used to evaluate the severity of CP at a mean age of 32.9 (SD 5.3) months. Logistic regression analyses were used.

Results: CP incidence decreased from 6.5% in period I, to 2.6%, 2.9% and 2.2% in period II-IV (p< .001). Simultaneously, cystic periventricular leukomalacia (c-PVL) decreased from 3.3% in period I to 1.7%, 1.0% and 1.3% in period II-IV (p=.004); especially c-PVL grade III from 2.3% in period I to 1.0%, 1.1% and 0.2% in period II-IV (p=.003). The number of children classified in GMFCS Levels III-V in period I compared to IV also decreased (p=.035). Independent risk factors for CP: c-PVL (Odds Ratio (OR): 92.7; 95% CI: 46.1-186.4) and severe intraventricular haemorrhage (OR: 12.8; 95% CI: 7.5-22.0). Independent protective factors: antenatal antibiotics (OR: 0.6; 95% CI: 0.3-1.0) and presence of an arterial line (OR: 0.4; 95% CI: 0.3-0.8).

Conclusions: CP incidence and severity declined from 1990-1993 onward in preterm born children and this could especially be attributed to a reduction in severe c-PVL.

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CONTRIBUTION OF CONGENITAL ANOMALIES TO PRETERM BIRTH RISK IN THE NETHERLANDS

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Objective: To asses the extents to which congenital anomalies affect risk of preterm birth.

Methods: For the present study, we analysed data on 1,972,058 newborns registered in the Netherlands Perinatal Registry database (inclusion criteria 16 weeks of gestation). Logistic regression techniques were applied to estimate risks of preterm (< 37 weeks), very preterm (< 32 weeks) and extremely preterm (< 24 weeks) birth for newborns with congenital anomalies. Adjustments were made for neonatal (gender, plurality) and maternal (age, parity, previous abortions, assisted reproductive management, diabetes) characteristics. Results were expressed as odds ratios (ORs).

Results: The overall risk of preterm birth was 3.8-fold higher in newborns with congenital anomalies, as compared to newborns without congenital anomalies. Preterm birth risk was elevated in all organ systems, but especially among newborns with congenital anomalies of the central nervous system (OR 8.8) or the respiratory system (OR 5.8), and among newborns with chromosomal or syndromal anomalies (OR 8.0).

The overall very preterm and extremely preterm birth risks were respectively 8.4-fold and 11.2-fold higher in newborns with congenital anomalies. Among newborns with anomalies of the central nervous system and among newborns with chromosomal

or syndromal anomalies, risks of very preterm birth (ORs 22.1 and 18.6, respectively) and of extremely preterm birth (ORs 37.6 and 31.5, respectively) were much higher.

Conclusions: Congenital anomalies are associated with increased risk of preterm birth. Congenital anomalies of the central nervous system and chromosomal or syndromal anomalies are important risk factors for preterm birth.

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RISK FACTORS FOR CONGENITAL ANOMALIES IN THE NETHERLANDS

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Objectives: To determine the relation between several potential risk factors and the risk of having a newborn with one or more congenital anomalies.

Participants: Data on 1,594,380 registered newborns from the Netherlands Perinatal Registry database were analysed. Logistic regression models were used to estimate the risk of having a newborn with anomalies.

Results: All studied risk factors were significantly related to the risk of having a newborn with anomalies. The highest adjusted risks were observed for pre-existing maternal diabetes (OR=2.0) and maternal epilepsy (OR=2.1). For maternal diabetes the risk was especially elevated in the cardiovascular system and for maternal epilepsy in the central nervous system. High maternal age, IVF/ICSI pregnancy, male gender and plurality were also strongly related to the risk of having a newborn with anomalies. The PARs were especially high for male gender, primiparity, high maternal age and non-Western ethnicity (respectively 18.4, 5.0, 2.5 and 1.7). The PARs for maternal diabetes, epilepsy and IVF/ICSI were very small as the prevalence of these risk factors in the general population is very low. In total 30% of the registered anomalies could be ascribed to the studied risk factors.

Conclusions: Strategies for primary prevention of congenital anomalies should focus on different risk factors depending on the approach used. For a high-risk group approach existing maternal morbidity such as diabetes and epilepsy are important factors. For a public health approach, however, factors such as high maternal age, primiparity and ethnicity are more important to focus on, for example in preconception counselling.

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HEALTH RELATED QUALITY LIFE IN 7-YEAR-OLD CHILDREN BORN VERY PRETERM OR WITH VERY LOW BIRTH WEIGHT

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Background and aims: Neuromotor, intellectual and behavioural developmental disabilities increase with lower gestational age (GA). The aim of this study is quantify the effect of prematurity and other determinants (biomedical, developmental and social) on health-related quality (HRQoL).

Methods: Follow-up study with prospective data collection from birth up to age 7 in children born < 32 weeks gestational age (VP) or < 1500 g (VLBW) discharged. Standardized developmental assessment was performed at age 2, 4 and 7. HRQoL was assessed at 7 by proxy with KIDSCREEN-10, that provides a global index score (0-100) and category thresholds by domain. 169 infants were enrolled. Non responders (39%) showed more favourable neonatal characteristics than responders (e.g. respectively, GA 29.9 vs. 29.0). **Results:** 102 children were included in the analysis (32% with GA< 28 and 46%>29). Low QoL (score< under the first quartile) was associated with neonatal characteristics: BW< 750g [odds ratio (95CI) 3.6 (1.1-11)], GA< 28weeks [2.2 (0.9-5.2)], multiplicity [2.9 (1.2-6.9)]; and with outcomes at 7 years [adjusted for GA and multiplicity, for both p< 0.05 in all the following models]: intellectual impairment [3.4(1.1-11)], behavioural disability [2.7(1.0-7.8)],communication disability [3.4(1.1-10)], visual aids [2.9(1.1-8.0)], non-mainstream schooling [4.7(1.6-13)]. Children born small for gestational age, with abnormal neonatal ultrasound findings, or classified as cerebral palsy, did not show an increased risk of low QoL at 7 years.

Conclusions: This study suggests that lower gestational age, multiplicity and some developmental disabilities, but not CP, reduce, consistent and independently, parents-reported QoL of school-age children born VP or with VLBW.