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Institutionen för Kvinnors och Barns Hälsa

Growth and morbidity in extreme preterm born infants

AKADEMISK AVHANDLING

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ABSTRACT

Background: Rapid development in neonatal care during the past years has significantly improved long-term survival of extreme preterm born (EPB) infants creating a population of children with a high frequency of disabilities. Being lighter and shorter, as compared to full-term (FT) born child, predisposes the EPB infants to intensive nutritional interventions aiming for growth-promoting effect. The existing cross-sectional preterm growth charts reflect an intra-uterine growth but are used for monitoring of extra uterine growth. Long-term data on postnatal growth are sparse. The **aim** of this thesis was to describe the growth pattern and morbidity from birth to 10 years in hospital-based cohort of EPB infants born 1990-2002 in Sweden and treated at Karolinska University Hospital (KS), Neonatal Intensive Care Unit (NICU) and/or Sahlgrenska hospital (SH). **Paper I** covers retrospective longitudinal cohort of 162 infants born before 26 + 0 weeks of gestation. We studied body weight (Wt), height (Ht) and head circumference (HC) from birth to FT age and compared it to the new Swedish birth size reference. We showed that the majority of the infants showed a pronounced postnatal growth restriction (PGR) and at discharge from NICU, 75 % of initially appropriate for gestational age infants were below -2 SDS for at least one of the body size variables. **Paper II** is a retrospective review of 114 children born before 25 + 0 weeks of gestation; we studied the frequency of ROP and visual acuity (VA). We found that 75% of the children developed severe ROP (stage ≥ 3), often in combination with additional functional deficits as a consequence of brain dysfunction. Normal VA (≥ 0.8) in at least one eye was found in 50% of all infants, more common in girls, while visual impairment (VA < 0.33) was more common in boys. **Paper III** is a retrospective longitudinal study of 123 children born before 26 + 0 weeks of gestation; morbidity and body Wt, Ht, HC from FT to 10 years were studied comparing with the Swedish growth reference. We showed that a significant catch up (CU) in Ht and Wt occurred; by age 10 years the attained mean Ht was in accordance with the genetic potential. Significant cognitive, motor disorder and/ or developmental comorbidity were found in 48% boys and 34% girls and severe ROP in 79 % and 66% respectively. In **Paper IV**, we studied the magnitude of catch-up (CU) growth 10 years after FT age and its impact for attained Ht and Wt during childhood in the cohort from Paper III. We showed that the most pronounced CU growth in both Wt and Ht occurred during the first year after FT age; followed by a plateau between 1 and 2 years but with more pronounced Wt than Ht development, a trend that continued until 10 years. Children with rapid CU in Wt three months after FT age were significantly heavier and taller at 1 and 2 years but not taller at 10 years compared to children with slower growth tempo. In **summary**, this thesis demonstrates that EPB infants show a continuous PGR in Wt, Ht and HC as compared to birth size references. Neither the birth-size derived growth curves nor the presented charts are supposed to be used as a single prescriptive standard for extra uterine growth of this population. By 10 years of age the majority of children had reached normal or near-normal Ht close to their genetic potential but Wt development was higher than Ht development, possibly leading to a disadvantageous metabolic situation. EPB infants, especially boys are at high risk for visual impairment and therefore rehabilitation of these children with a combination of disabilities is a challenge. The most challenging period is between birth and FT, which may be a critical window for development of the central nervous system.