

First-Year Growth and Development of 445 Preterm Infants: A Clinical Study

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Abstract : Aim: To study the growth pattern of preterm infants during the first year of life and explore the association between head circumference (HC) and neurodevelopment sequences and to get a general knowledge of the incidence of anemia in preterm babies in Chengdu, Southwest China. Method: We conducted a prospective longitudinal study, neonates with gestational age < 37 weeks were enrolled this study from 2012.1.1 to 2014.7.9. Anthropometry (weight, height, HC) was obtained at birth, every month before 6 months-old and every 2 months in the next half year. All the infants' age were corrected to 40 weeks. Growth data presented as Z-scores which was calculated by WHO Anthro software. Z-score defined as (the actual value minus the average value)/standard deviation. Neurodevelopment was assessed at 12 months-old [9-11 months corrected age (CA)] by using "Denver Development Screen Test (DDST)". The hemoglobin (Hb) was examined at 6 months for CA. Result: 445 preterm infants were followed-up 1 year, including 64 very low birth weight infants (VLBW), 246 low birth weight infants (LBW) and 135 normal birth weight infants (NBW). From full-term to 12 months after birth, catch-up growth was observed in most preterm infants. From VLBW to NBW, HCZ was -1.17 (95 % CI: -1.53,-0.80; P value < 0.0001) lower during the first 12 months. WAZ was -1.12 (95 % CI: -1.47,-0.76; p < 0.0001) lower. WHZ and HAZ were -1.04 (95%CI:-1.38, -0.69; P<0.0001) and -0.69 (95%CI:-1.06,-0.33; P < 0.0001) lower respectively. The peak of WAZ appeared during 0-3 months CA among preterm infants. For VLBW infants, the peak of HAZ and HCZ emerged at 8-11 months CA. However, the trend of HAZ and HCZ is the same as WAZ in LBW and NBW infants. Growth in the small for gestational age (SGA) infants was poorer than appropriate for gestational age (AGA) infants. The rate of DQ < 70 in VLBW and LBW were 29.6%, 7.7%, respectively (P < 0.0001). HCZ < -1SD at 3 months emerged as an independent predictor of DQ scores below 85 at 12 months after birth. The incidence of anemia in preterm infants was 11% at 6 months for CA. Moreover, 7 children (1.7%) diagnosed with Cerebral palsy (CP). Conclusions: The catch-up growth was observed in most preterm infants. VLBW and SGA showed poor growth. There was imbalance between WAZ and HAZ in VLBW infants. The VLBW babies had higher severe abnormal scores than LBW and NBW, especially in boys. Z score for HC at 3 months < -1SD was a significant risk factor for abnormal DQ scores at the first year. The iron supplement reduced the morbidity of anemia in preterm infants.

Keywords : preterm infant, growth and development, DDST, Z-scores

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