POSTNATAL GROWTH IN PRETERMS WITH BRONCHOPULMONARY DYSPLASIA

Ahmed Abushahin , Amal Alnaimi , Ashraf Soliman A., Vincenzo De Sanctis

Departments of Pediatrics, Hamad Medical Center, Doha, Qatar; and Alexandria University Hospital, 2 Pediatric and Adolescent Outpatient Clinic, Quisisana Hospital, Ferrara, Italy

Introduction

Bronchopulmonary dysplasia (BPD) is a chronic lung disease of infancy that affects typically premature infants with a reported incidence of 25% among those with 751–1000 g birth weight. BPD-PT exhibit abnormalities in lung function after birth, during the first years of life, throughout childhood and into early adolescence. BPD-PT appear to have higher risk of slow postnatal growth and psychomotor development because of increased respiratory work, hypoxemia episodes, postnatal corticoid, reduced nutritional intake and increased rate of infections

Aim of the study

To describe the postnatal somatic growth pattern during the first 18-24 months for preterms with different severity of BPD infants and study the effect of different neonatal risk factors on their growth. We also stress the importance of corrected vs uncorrected age for the growth evaluation.

Patients and Methods

A total of 80 surviving preterm infants with gestational age (GA) less than 30 weeks and BPD (BPD-PT), admitted to the Neonatal Intensive Care Unit (NICU) of Hamad General Hospital, between January 2008 and January 2012, Doha (Qatar) were enrolled in this retrospective study. Birth data included birth weight (Wt) , length (L) and head circumference (HC) , gestational age (GA), gender, delivery method and multiple birth status were extracted from the medical record at the time of discharge from the neonatal nursery. GA was determined from the date of the mother's last menstrual period.

Neonatal risk factors for each subject included duration of positive pressure support (MV), duration of oxygen requirement (O2 days), presence of ductus arteriosus (PDA) confirmed with echocardiography, sepsis defined as a positive blood culture in the presence of clinical signs of infection. Infants were followed up in the outpatient clinic until 24 months of age.

Anthropometric measurements for each subject including Wt, L, and HC were extracted from subjects' medical records at birth, 4 months to 8 months, and 15 months to 21 months of age respectively. Z scores for Wt, L ,and HC were calculated at birth, based on the growth curves by Voigt et al.

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Results

Sixty nine preterm infants with VLBW out of the 80 had the full data for this study (39 females). They had a mean GA=26.5±0.71 weeks. 42 were born by Cesarean section (CS), 31 were twins. 40 infants had mild BPD, 20 had moderate and 9 had severe BPD. 45 had sepsis, 14 had PVH, 14 had NEC, and 36 had PDA.

Table 1. Growth in length (LSDS) in preterms with BPD during the first 2 years of life

	LSDS birth	LSDS 2 uncor	LSDS2 cor	LSDS3 uncor	LSDS3 Cor
Mean	**-0.22**	**-2.4***	**-0.43**	**-1.4***	**-0.92**
SD	**1**	**1.7**	**1.64**	**1.28**	**1.4**

*LSDS= Length SDS, using corrected (cor) versus uncorrected (uncor) age ; * p < 0.05 LSDS corrected vs uncorrected*

Table 2. Assessment of Length and head circumference growth using corrected versus uncorrected age for preterms with BPD

Using uncorrected age	Birth ±	8±2 months	16±3 months
Length SDS < -2	4.3	45%	25%
Using corrected age	Birth	4±2 months	12±4 months
Length SDS < -2	4.3%	5.8%	20%
Using uncorrected age	Birth	8±2 months	16±3 months
Head SDS < -2	1.5%	52%	27.5%
Using corrected age	Birth	4±2 months	12±4 months
Head SDS < -2	1.5%	14.4%	22%

Table 3. Effect of different BPD severity on somatic growth

BPD		LSDS Birth	LSDS 3	HCSDS Birth	HCSDS 3	MV (d)
Mild	**Mean**	-0.12	0.11	0.07	-1.33	29.4
	SD	1.04	1.55	0.87	1.29	16.7
Moderate	**Mean**	-0.4	-0.01	-0.39	-0.88	45.5
	SD	0.98	1.6	0.77	1.33	13.1
Severe	**Mean**	-0.29	-0.45	-0.15	-3.3	106
	SD	0.88	1.58	0.83	1.29	36.6
ANOVA P value		0.6	0.24	0.14	<0.001	<0.001

GA=gestational age, LSDS=length SDS, HCSDS=head circumference, MV=duration of mechanical ventilation. 3=at 16 ±3 months of age

96 % of infants were appropriate for gestational age (AGA). Only 4% preterms had birth weight SDS < -2 for GA, and 4% had length SDS (LSDS) < -2.

84 % of PT-BPD had normal or accelerated GV during the 16 +/- 3 months period.

At 8 +/- 2 months of uncorrected age 45 % had LSDS <-2 .

At 16 +/- 3 months of age 25% had LSDS < -2.

At 8 +/- 2 months 13% had body mass index SDS< -2 .

At 16 +/- 3 months 5.8% had BMISDS < -2.

At 8+/- 2 months 52% had HCSDS2 <-2.

At 16+/-3 months 27.5% had head circumference SDS (HCSDS) < -2.

72.5 % of PT-BPD had normal HCSDS compared to FT infants at 16 +/- 3 months.

The co-existence of BPD with sepsis, NEC, PDA, twinning significantly affected their growth parameters postnatally

Conclusions

At 16 +/- 3 months postnatally, BPD-PT with severe BPD were shorter and had smaller HCSDS versus those with moderate severity. Catch-up growth occurs in the majority of these PT.

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