THE RELATION BETWEEN SERUM INSULIN-LIKE GROWTH FACTOR-1 LEVELS AND BRONCHOPULMONARY DYSPLASIA IN PRETERM NEWBORNS

Nukhet ALADAG CİFTDEMİR, Betül ACUNAS, Ulfet VATANSEVER, Rıdvan DURAN
Trakya University Faculty of Medicine, Pediatrics, Edirne, Turkey

INTRODUCTION

With recent advances in perinatal care which has improved the survival rates of very low birth weight newborn infants, the definition of bronchopulmonary dysplasia has immensely changed. Insulin-like growth factor-1 (IGF-1) plays a role in both prenatal and postnatal lung development. The aim of this study was to investigate the relationship between postnatal serum IGF-1 levels and BPD in preterm infants.

MATERIAL METHODS

- 67 infants less than or equal to 34 weeks of gestational age were recruited prospectively to our study.
- Those infants who developed bronchopulmonary dysplasia were designated as Group 1 (n=12) and those who did not as Group 2 (n=55).
- Prenatal, natal and postnatal data of the cases were recorded.
- Serum “insulin like growth factor-1” levels were measured from venous blood samples of each infant on days 1, 7, 14 and 28 after birth.

RESULTS

Table 1. Comparision of the demographic features

	BPD (+) (n=12)	BPD (-) (n=55)	p
Week of gestation*	28, 26-32	33, 26-34	p<0,001
Birth weight**	1030±323	1423±350	p=0,001
Gender (male)***	7 (58,3)	25 (45,5)	p=0,624
AGA***	10 (83,3)	38 (69,1)	p=0,485
SGA***	2 (16,7)	17 (30,9)	
Type of delivery (vaginal)***	11 (91,7)	6 (10,9)	p<0,001
Place of birth (our hospital)***	9 (75)	48 (87,3)	p=0,368
Duration of hospital stay**	78,9±32,6	39,5±20	p<0,001
Exitus***	7 (58,3)	-	-
Exitus time**	85,3±42,5 (n=7)	-	-

*Median, minimum-maximum **Mean±SD; ***Number of cases (%);
BPD: Bronchopulmonary dysplasia; AGA: Appropriate for gestational age; SGA: Small for gestational age

Table 2. Comparison of postnatal features

	BPD (+) (n=12)	BPD (-) (n=55)	p
RDS Type 1*	11 (91,7)	23 (41,8)	p=0,005
Radiographic findings*			
Normal	1 (8,3)	41 (74,5)	p<0,001
Severe RDS	11 (91,7)	14 (25,5)	
Surfactant therapy*	11 (91,7)	33 (60)	p=0,046
First 48 hours pH**	7,26±0,07	7,33±0,05	p<0,001
First 48 hours PCO ₂ (mmHg)**	47,65±7,5	41,82±7,26	p=0,018
Mechanical ventilation*	12 (100)	21 (38,2)	p<0,001
Duration of mechanical ventilation (hours)***	729,4±776,9	50,8±58,7	p<0,001
Maximum PIP**	20,8±3,6	19,6±2,5	p=0,273
Maximum PEEP***	4, 4-5	4, 4-5	p=0,692
Maximum BPM***	50, 40-80	40, 30-82	p=0,009
Maximum FiO ₂ (%)***	70, 50-100	60, 50-100	p=0,228
Duration of O ₂ treatment (days)***	45, 35-153	2, 0-27	p<0,001
Theophylline/Caffeine treatment*	12 (100)	26 (47,3)	p=0,003
Confirme sepsis*	10 (83,3)	8 (14,5)	p<0,001
ROP*	3 (25)	5 (9,1)	p=0,038
Apnea*	12 (100)	16 (29,1)	p<0,001
NEC*	7 (58,3)	13 (23,6)	p=0,018
Transfusion*	12 (100)	22 (40)	p<0,001
Transfusion time**	19,8±13,2	3,9±3,4	p<0,001
Day of first feeding***	10, 4-51	4, 1-55	p=0,008
Day of full feeding***	64, 45-65	14, 6-76	p=0,002
Feeding type*			
Mother’s milk	4 (33,3)	24 (43,6)	p=0,512
Mother’s milk+prematüre formula	4 (33,3)	31 (56,4)	

Table 3. Independent risk factors related to bronchopulmonary dysplasia

Variable	Odds ratio	%95 GA	p
Chorioamnionitis	12,3	2,4-63,4	p=0,003
Antenatal hemorrhage	6,3	1,6-23,9	p=0,008
Antenatal steroid	0,2	0,09-0,8	p=0,008
Type of delivery (vaginal)	89,8	9,7-823	p<0,001
RDS	15,3	1,8-127	p=0,005
Sepsis	28,7	5,28-156,3	p<0,001

Table 4. Comparision of IGF-1 levels

	BPD (+) (n=12)	BPD (-) (n=55)	p
IGF-1 day one* (ng/ml)	22,15±12,3	16,9±7,3	p=0,208
IGF-1 day seven* (ng/ml)	13,85±7,47	11,7±5	p=0,517
IGF-1 day fourteen* (ng/ml)	11±7	14,9±7	p=0,02
IGF-1 day twenty-eight* (ng/ml)	11,7±6	14,3±5,1	p=0,128

Figure 1. Daily change in IGF-1 levels

Figure 2: ROC curve of IGF-1 levels in first and seventh day

We could not find any relation between bronchopulmonary dysplasia and serum “insulin like growth factor-1” levels in our study and concluded that the low number of infants with bronchopulmonary dysplasia could have limited the evaluation of this association. further and larger studies are required in this respect.