

Superior mesenteric artery doppler ultrasound characteristics and meconium obstruction of prematurity in small for gestational age infants

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Background

Meconium obstruction of prematurity (MOP) usually manifests as feeding intolerance in early postnatal days, and being small for gestational age (SGA) is a risk factor for MOP. The timely diagnosis and treatment of MOP are critical, but the pathogenesis is still obscure.

Methods

- We prospectively enrolled 37 preterm infants (<34 gestational weeks) who were SGA (birth weight<10P).
- The superior mesenteric artery blood flow characteristics of each neonate were measured with Doppler ultrasound during the first 48 hours of life (T1) and between the fifth and seventh day of life (T2) sequentially.
- Demographics, comorbidities, and outcomes were recorded and analyzed.

Results

Table 1. Basal characteristics

	Control (n=29)	MOP (n=8)	<i>P</i> -value
GA (weeks)	30.32 ± 2.49	31.45 ± 2.18	0.217
Birth weight (g)	995.6 ± 309.9	688.8 ± 288.1	0.017
Cesarean section	26 (89.7%)	6 (75%)	0.292
Birth weight z-score	-1.95 ± 0.43	-2.33 ± 0.688	0.061
Apgar score at 1 min	4.63 ± 2.13	5.03 ± 1.52	0.542
Apgar score at 5 min	7.13 ± 1.96	7.62 ± 1.05	0.510
Sex (male)	6 (75%)	20 (69%)	0.742
RDS	3 (37.5%)	11 (37.9%)	0.982
BPD	5 (62.5%)	11 (37.9%)	0.214
PPHN	2 (25%)	7 (24.1%)	0.960

GA: gestational age; RDS: respiratory distress syndrome; BPD: bronchopulmonary dysplasia; PPHN: persistent pulmonary hypertension of the neonate

Table 2. Superior mesenteric artery doppler ultrasound characteristics

	Control (n=29)	MOP (n=8)	<i>P</i> -value
Prenatal	(n=22)	(n=6)	
PI	5.92 ± 13.52	1.58 ± 0.43	0.445
RI	0.83 ± 0.12	0.73 ± 0.79	0.077
S/D ratio	8.47 ± 15.42	3.83 ± 1.32	0.474
PSV	29.8 ± 12.15	28.17 ± 13.2	0.776
T1	(n=29)	(n=8)	
PI	3.85 ± 2.35	3.67 ± 2.50	0.853
RI	0.91 ± 0.12	0.86 ± 0.12	0.358
S/D ratio	7.45 ± 3.46	19.47 ± 35.1	0.225
PSV	52.95 ± 18.35	40.24 ± 7.67	0.007
T2	(n=28)	(n=8)	
PI	2.20 ± 1.00	4.82 ± 3.63	0.082
RI	0.80 ± 0.09	0.86 ± 0.11	0.118
S/D ratio	6.54 ± 9.14	3.31 ± 3.10	0.336
PSV	60.94 ± 22.12	39.35 ± 17.9	0.016

PI: pulsatility index; RI: resistive index; S/D ratio: ratio between the systolic velocity and the diastolic velocity; PSV: peak systolic velocity

- In the logistic regression analysis, including birth weight z-scores at birth, PSV at T2 was significantly associated with MOP occurrence (OR 1.066, 95% CI 1.006-1.129, *P*=0.031).

Conclusion

The intestinal blood flow may be associated with MOP in preterm SGA infants.