Evaluation of Superior Mesenteric Artery (SMA) and Celiac Artery (CA) Blood Flow Pattern in Preterm Infants and Factors Influencing the Blood Flow

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Abstract

Objective: To evaluate the blood flow velocity (BFV) in superior mesenteric artery (SMA) and celiac artery (CA) in first 2 days of life in preterm (less than 32 week and less than 1 kg) and to study the influence of various factors on the blood flow velocities in the same population.

Methods: 50 preterm less than 32 week with birth weight less than 1kg was included in the prospective observation study. Assessment of SMA and CA blood flow velocities (PSV: peak systolic velocity, EDV: end diastolic velocity, TAV: time average velocity) was done twice at 24hr (20-30) and at 48hr (40-54). Blood flow indices (resistive index; RI, pulsatile index; PI) was calculated using the formula. Simultaneously data for various factors influencing the blood flow in SMA and CA was collected in the similar population.

Results: SMA BFV increases from 24hr after birth and continue to rise thereafter in first 2 days. Significant increase in SMA EDV (6.77 ± 2.38 vs 8.74 ± 4.42) and SMA PSV (37.16 ± 10.64 vs 42.72 ± 14.66) was noted postnatally. Increase in SMA TAV was also observed. CA BFV showed negative trend from 24hr after birth with reduction of all velocities (PSV, EDV and TAV). CA TAV showed significant reduction at 48hr of age compared to 24hr (28.22 ± 9.81 vs 25.00± 8.07). Significant PDA was associated with attenuated BFV in both the SMA and CA on both the occasions. Other factors associated with adverse blood flow velocities were blood transfusion and anemia. Trophic feeding was associated with increased blood flow velocities in both SMA and CA.

Conclusion: Postnatally increase in SMA BFV was noted in first 2 days of life indicating improved intestinal perfusion and opposite trend in CA BFV. Significant PDA was associated with abnormal blood flow velocities in both SMA and CA.

Keywords: Blood Flow Velocity (BFV); Superior Mesenteric Artery (SMA); Celiac Artery (CA); Hemodynamically

prospective study to evaluate the blood fow velocity in SMA and CA with simultaneous assessment of various factors infuencing the blood fow pattern. Exclusion criteria were major congenital malformations, critical congenital heart disease and evidence of perinatal asphyxia requiring signifcant resuscitation (need of drugs).

T e demographic data of study population is shown in table 1 and 2.

T is

For ea
scans. P
increase
EDV (P (

Variable	
Sex	
GA(wk)	
Birth weig	

Table 2: D

SMA	P
	E
	T
	R
	P
CA	P
	E
	T
	R
	P

*p<0.05, **p

Data are th

PSV: Peak
mean velo
mesenteric

SGA preterm (n=20; table1) had low SMA velocities compared to AGA (n=30), whereas CA BFV were comparable in both the groups.

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