DOI:10.3305/nh.2010.25.2.4641

Cartas científicas

Evolution of mesenteric artery blood flow in healthy premature neonates

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This study aims to analyze the superior artery blood flow in healthy premature neonates with birth weight between 1,000 g and 1,500 g, on the first and seventh days of live.

It is a prospective cohort study, including 15 premature neonates with mean weight of 1,243g ± 173.6 (ranging from 1,000 to 1,495 g). Exclusion criteria were: unstable hemodynamic conditions; assisted ventilation with high parameters; large deformations or clinical syndromes; feeding intolerance; necrotizing enterocolitis; and conditions those alter the mesenteric flow: phototherapy, umbilical catheters, patient ductus arteriosus and sepsis.

The Doppler velocimetric examination was done by a 8 MHz imaging transducer, and the pulsed color Doppler readings were obtained by sonographic waves at 4 MHz. The neonate was kept in a supine position, with the transducer positioned in the epigastric region, immediately below the xyphoid appendix, obtaining two dimensional images of the celiac trunk and of the superior mesenteric artery, a few millimeters after its emergence from the aorta in the sagital plane.

The flux measurements were obtained in the longitudinal direction of the vessel and at an isonation angle between 0 and 20 degrees. The blood flow curves were recorded after a sequence of five stable measurements, with respect to the quality of the waves, and their audible characteristics. The following measurements were obtained: Peak Systolic Velocity (PSV), End Diastolic Velocity (EDV), Resistance Index (RI), and Pulsatility Index (PI).

The values obtained were expressed in means and standard deviations. The measurements were done prior to feeding (up to 30 minutes) and after feeding (between 15 and 60 minutes). The measurements were done on the first day (between the 6th and the 24th hours of life), and on the 7th day of life. The comparison of means and standard deviations was carried out by ANOVA.

Table I lists the values of RI, PI, PVS, and EDV, prior and after feeding, on the first and 7th days of life, in means and standard deviations.

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Recibido: 27-XII-2009.
Aceptado: 28-XII-2009.

Table I
Resistance Index (RI), Pulsatility Index (PI), Peak Systolic Velocity (PVS), End Diastolic Velocity (EDV) prior and after feeding, on the first and on the seventh days of life

	First day	*Seventh day*
RI prior to feeding	0.69 ± 0.07	0.78 ± 0.05
RI after feeding	0.66 ± 0.07	0.73 ± 0.08
PI prior to feeding	1.45 ± 0.20	1.81 ± 0.27*
PI after feeding	1.35 ± 0.39	1.6 ± 0.2
PVS (cm/s) prior to feeding	60.1 ± 23.4	95.3 ± 28.0*
PVS (cm/s) after feeding	57.2 ± 21.5	112.3 ± 38.0*
EDV (cm/s) prior to feeding	18.5 ± 6.2	20.0 ± 5.7*
EDV (cm/s) after feeding	20.3 ± 13.4	31.5 ± 19.5*

* $p < 0.05$.

In conclusion, these studied neonates showed a significant evolution of the blood flow of superior mesenteric artery on the 7th day of life, represented by the Peak Systolic Velocity and the End Diastolic Velocity improve, and a better vasodilatation response after feeding.

These results suggest for the Doppler velocimetry as a specific evaluation method for feeding introduction and progression, in order to reduce the prevalence of gastrointestinal inflammatory diseases in neonates, and to improve the neonatal survive[1-5].

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