

Newborns ≤ 32 Weeks Gestational Age with Patent Ductus Arteriosus: Is Perfusion Index Predictor of Ductal Closure?

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Background

Perfusion Index (PI) is a non-invasive, continuous indicator of peripheral perfusion and it seems to be a marker of severe conditions from different causes. Peripheral hypoperfusion may occur in preterm neonates with Patent Ductus Arteriosus (PDA); there is no agreement about indications for treatment and the benefit-risk balance is uncertain. PI could be useful for this purpose. *Objective:* 1) to validate the usefulness of PI as marker of clinical severity; 2) to evaluate the usefulness of PI as predictor of PDA closure, spontaneous or after minimal medical therapy.

Design/Methods

We studied 35 neonates born ≤ 32 weeks Gestational Age (GA) without malformation syndromes (mean GA: $29,33 \pm 2,04$ weeks; mean birth weight: 1192 ± 395 g). The newborns were divided according to ventilation support in Spontaneous Breathing (SB), Non Invasive Ventilation support (NIV) and Invasive Ventilation support (IV) and to way of PDA closure in group1 (spontaneous), group2 (COX-inhibitors cycle) and group3 (more COX-inhibitors cycles or surgical ligation). PI was measured at 25-48, 49-72, 73-96 hours of life; it was recorded continuously for 10' (average of values recorded every 20") at the right hand and foot by Masimo Radical 7 pulse oximeter. By 72 hours of life a color-Doppler echocardiography was performed; PDA was monitored daily until functional closure. Hemodynamically significant PDA with echocardiographic signs of left heart overload and/or systemic hypoperfusion was treated with COX-inhibitors and/or surgery (current Italian Neonatology Society Guidelines).

Results

At 25-48 hours of life, group SB had a significantly higher PI than group NIV ($2,00 \pm 0,60$ vs $1,34 \pm 0,36$, $p < 0,05$) and group IV ($2,00 \pm 0,60$ vs $1,12 \pm 0,11$, $p < 0,05$). Group1 (PI $1,56 \pm 0,55$) at 25-48 hours of life had higher PI values than group2 (PI $1,29 \pm 0,35$) and group3 (PI $1,19 \pm 0,20$).

Conclusions

PI measurement could be an effective method to monitor hemodynamic changes in preterm newborns. PI value is lower in patients with critical conditions and it seems to be predictive of spontaneous closure of DA.