9th World Summit on Neonatal Nursing and Health Care
49th International conference on Prosthodontics & Restorative Dentistry

November 17, 2023 | Webinar

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Hypotension in preterm neonates

Hypotension is a common problem in preterm newborn infants and is associated with increased mortality and morbidity. The incidence of hypotension in neonates varies greatly because of variations in the definition and treatment of hypotension. In newborn infants, blood pressure (BP) varies with gestational age, birth weight, gender, postnatal age and mode of delivery. The BP rises significantly during the first 72 hours with greater variability in the preterm newborn infants.

The threshold values of BP for potentially hypotension intervention are probably different for newborn infants of the same gestational age and weight and also changing for the same neonate during the first postnatal days. BP does not correspond well with cerebral perfusion.

During the postnatal transition after birth, there are significant changes in the output of both ventricles as well as systemic and pulmonary vascular resistance which contribute to the initial "physiological" decrease in BP, after that blood pressure spontaneously improves in VLBW infants during the first 24hr of life.

Many preterm infants continue receiving intervention for hypotension with little evidence to support such practices. The decision to treat hypotension couldn't be based only on threshold blood pressure (<30mmHg). Integrative approach by adding targeted neonatal echocardiography and cerebral near infrared spectroscopy to standard hemodynamic monitoring help to better understand pathophysiology of hypotension and early intervention before worsening of hemodynamics or progressing to metabolic acidosis. Standard hemodynamic monitoring (continuous invasive or non-invasive monitoring of BP, heart rate and oxygen saturation monitoring, capillary refill time, urine output, core-peripheral temperature gap (>2oC is abnormal) and regular blood gas/lactate monitoring) have limitation in assessment hemodynamic stability and ethology poor tissue (cerebral) perfusion.

Newborn infant's hypotensive on gestational age criteria but with clinical evidence of good perfusion has as good an outcome as normotensive patients. Treated only low blood pressure in these infants is associated with an adverse outcome.

Dopamine is the most commonly used first-line antihypertensive drug. Many studies showed that dopamine impair cerebral auto-regulation and is associated with long-term disabilities. Newborn infants who are treated for hypotension more frequently have brain injury, long-term disability or die compared to those who are not treated. Delayed cord clamping, decreased blood sampling, appropriate ventilatory management (i.e. avoiding excessive mean airway pressure and hypocarbia) and other attempts to avoid hypovolemia, anemia and decreased cardiac output may have an important role in supporting and optimizing autoregulation, reducing cerebral hypoperfusion and improving neurologic outcomes in the preterm VLBW infants.

An individual integrative approach to neonatal hypotension with more observations and considering the newborn's physiologic characteristics and underlying pathophysiology seems to be rational in the management rather than early antihypertensive interventions.

According to all the above it has been suggested that treatment of hypotension in preterm newborn infants must be done with caution and that hypotension should be treated only with clinical evidence of poor perfusion associated with hypotension.

Biography

Brankica Vasiljevic is working in NMC Royal Hospital DIP in Dubai first as Head of Department of Neonatology and from 2017 as Head of Maternity and Child Health Service. She has overall more year's clinical experience, 26 years as pediatrician and 20 years as neonatologist. She was Consultant Neonatologist and Head of NICU in Clinical Canter of Serbia and lecturer (Neonatology) in Belgrade University of School of Medicine before she joined to NMC Hospital in Dubai. She was won the ESPNIC Educational Grant at 5th World Congress on Pediatric Intensive & Critical Care in Genevam Switzerland (2007). She was published more than 35 international publications in international indexed journals (more than 100 citations) and 5 chapters in various fields of neonatal medicine and also has more than 30 presentations to her credit out of which more than 10 are in international conferences.

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Received Date: September 26, 2023; **Accepted Date:** September 28, 2023; **Published Date:** December 26, 2023