ANZCOR Guideline 13.9 – After the Resuscitation of a Newborn Infant

Guideline

1 Documentation of Resuscitation

For clinical and medicolegal reasons the observations, interventions and times during neonatal resuscitation must be fully documented.

The Apgar scores quantify and summarise the response of the newborn infant over the first few minutes of life.[1,2] The Apgar score is assessed and recorded based on observations made at 1 and 5 minutes after birth and then sequentially every 5 minutes until the heart rate and breathing are normal. Interventions for depressed infants should not await Apgar scoring.

2 Continuing Care of the Newborn Infant after Resuscitation

Once adequate ventilation and circulation have been established, the infant who has required resuscitation remains at risk and should be assessed in an intensive or special care nursery where monitoring, appropriate evaluation and care can be provided.[3,4] An infant who has experienced perinatal compromise or has ongoing respiratory distress may have dysfunction or delayed perinatal adaptation of brain, heart, gastrointestinal tract, kidneys or other organs. Fluid balance and nutrition should be monitored carefully for the first few days.

2.1 Cardiorespiratory management

Usually, any infant who has been intubated and ventilated for resuscitation should not be extubated until the infant has been carefully assessed and the risk of the need for re-intubation has been assessed as being low. Preterm infants and selected others may benefit from surfactant administration. The assessment of infants who have required assisted ventilation should include oxygen saturation, heart rate, respiratory rate and effort. Blood pressure, blood glucose measurement and blood gas analysis are also often indicated.

2.2 Blood glucose management

Blood glucose level should be checked soon after resuscitation.[3,4] Infants who require resuscitation are more likely to develop hypoglycaemia. Although no exact threshold level at which outcomes worsen has been identified, maintaining a blood glucose level above 2.5 mmol/L for infants who have required resuscitation is unlikely to cause harm.

[Class B, expert consensus opinion]. A glucose infusion of 4-6 mg/kg/min will usually be sufficient. Large bolus doses of glucose (>100-200 mg/kg) should be avoided (1 ml of 10% glucose contains 100 mg) [Class B, expert consensus opinion].

2.3 Antibiotics

The need for resuscitation can be a consequence of the onset of sepsis. Very soon after resuscitation, consideration should be given to the need for relevant investigations and antibiotic treatment.

2.4 Induced Hypothermia for Hypoxic Ischaemic Encephalopathy (HIE)

Inducing hypothermia in infants with evolving moderate to severe hypoxic ischaemic encephalopathy will reduce the degree of brain injury in some [LOE II[5]]. Local guidelines should be developed to identify term and near term infants (gestation ≥ 35 weeks) who meet any of the following criteria, that resemble those used in clinical trials of induced hypothermia:

- Need for prolonged resuscitation; e.g. need for assisted ventilation and/or chest compressions at 10 min
- Apgar score at 10 minutes ≤5
- Acidosis as determined by cord blood gas or sample taken from the infant soon after birth, e.g. pH <7.0 or base excess worse than -12 mmol/L.

Many but not all such infants will have experienced an intrapartum sentinel event such as cord prolapse, severe abruption, or severe dystocia. The absence of such a recognised event does not preclude the possibility that the baby will benefit from induced hypothermia.

Infants who are at risk should have their neurological status assessed over the first few hours after birth. Those who develop signs of moderate or severe encephalopathy should have induced hypothermia commenced within 6 hours.

Any infant who is considered a candidate for therapeutic hypothermia should be discussed promptly with a neonatologist, and plans should be made for admission to a neonatal intensive care unit [Class A, expert consensus opinion]. Cooling should be conducted under carefully defined protocols, consistent with those used in the randomized, controlled trials, i.e. commence within 6 hours after birth, cool to 33-34^{0}C, continue for 72 hours and re-warm gradually, monitor for known adverse effects of cooling, and plan long term follow-up for all treated infants [Class A, expert consensus opinion]. Cooling can be initiated without specialized equipment. [5]

2.5 Stabilisation and Transfer

It is well established that wherever possible, babies who are likely to require neonatal special or intensive care should be born at a centre that can provide an appropriate level of care [Class A, expert consensus opinion]. Babies born elsewhere who require intensive or special care should be transferred [Class A, expert consensus opinion]. Early consultation should be undertaken to discuss management and arrange transport or retrieval [Class A, expert consensus opinion].

3 Continuing Care of the Family

Regardless of the outcome, witnessing the resuscitation of their baby is distressing for parents. Every opportunity should be taken to prepare parents for the possibility of a resuscitative effort when it is anticipated and to keep them informed as much as possible during and certainly after the resuscitation. Whenever possible, information should be given by a senior clinician. Early contact between parents and their baby is important.

Difficult resuscitations are also stressful for the staff involved, regardless of seniority, and efforts should be made to debrief after such events. Well-conducted debriefing also represents an opportunity to improve skills.

References

1. Apgar V, James LS. Further observations on the newborn scoring system. Amer J Dis Child 1962;104:419-28.

2. Casalaz DM, Marlow N, Speidel BD. Outcome of resuscitation following unexpected apparent stillbirth. Arch Dis Child Fetal Neonatal Ed 1998;78:F112-F5.

3. Kattwinkel J, Perlman JM, Aziz K, et al. Special Report--Neonatal Resuscitation: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Pediatrics 2010;126(5):e1400-13.

4. Richmond S, Wyllie J. European Resuscitation Council Guidelines for Resuscitation 2010 Section 7. Resuscitation of babies at birth. Resuscitation 2010;81(10):1389-99.

5. Jacobs SE, Morley CJ, Inder TE, et al. Whole-body hypothermia for term and near-term newborns with hypoxic-ischemic encephalopathy: a randomized controlled trial. Archives of pediatrics & adolescent medicine 2011;165:692-700.