Educational Topic 12: Immediate Care of the Newborn

Rationale: Assessment of the newborn allows recognition of abnormalities requiring intervention.

Intended Learning Outcomes:
A student should be able to:

• List techniques for assessing newborn status
• Describe immediate care of the normal newborn
• Recognize situations requiring immediate intervention in newborn care
• Describe the risks and benefits of male infant circumcision

TEACHING CASE

CASE: A term male newborn infant at 5 minutes of age is assigned an Apgar score of 4 at 1 minute by the charge nurse. Currently, he has a heart rate of 110, a vigorous cry, active motion of all four extremities, bluish hands and feet, and a positive grimace. Because of the low 1-minute Apgar score, the charge nurse sent a cord gas. The 5-minute Apgar is 9. The following umbilical arterial gas measurements were noted: pH 7.14, pCO$_2$ 69 mm Hg, HCO$_3$ 23.

COMPETENCY-BASED DISCUSSION & KEY TEACHING POINTS:
Competencies addressed:

• Patient Care
• Medical Knowledge
• Systems-Based Practice

1. How do you decide if this newborn is doing well?

Apgar scores are a useful aid to evaluate the clinical status of the newborn and the need for resuscitation. The 1-minute Apgar score is used to identify an infant’s need for immediate resuscitation. An infant with a score of 4-6 at 1 minute demonstrates depressed respiration, flaccidity and poor color. In general, these infants respond to stimulation and do not need resuscitation efforts, i.e. ventilation. A 5-minute Apgar of 7 or greater is normal.
The Apgar Scoring System is reflected in the following table:

<table>
<thead>
<tr>
<th>Sign</th>
<th>0 Points</th>
<th>1 Point</th>
<th>2 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate</td>
<td>Absent</td>
<td>Below 100</td>
<td>Over 100</td>
</tr>
<tr>
<td>Respiratory effort</td>
<td>Absent</td>
<td>Slow, irregular</td>
<td>Good, crying</td>
</tr>
<tr>
<td>Muscle tone</td>
<td>Flaccid</td>
<td>Some flexion of extremities</td>
<td>Active motion</td>
</tr>
<tr>
<td>Reflex activity</td>
<td>No response</td>
<td>Grimace</td>
<td>Cry or withdrawal</td>
</tr>
<tr>
<td>Color</td>
<td>Blue, pale</td>
<td>Body pink, extremities blue</td>
<td>Completely pink</td>
</tr>
</tbody>
</table>

*From Beckman & Ling, Obstetrics and Gynecology, 7th Edition

The Apgar score is useful to assess the condition of the infant at birth and to predict survival through the immediate neonatal period. It should not be used alone as evidence to assess neurologic damage and/or hypoxia. Another tool is the umbilical cord blood gas, which should be obtained when fetal compromise is suspected including a low 5 minute Apgar score. The blood gas consists of pH, pO2, pCO2, bicarbonate and base deficit. It is ideal to obtain both an umbilical artery and vein sample.

An umbilical arterial blood pH < 7.2 is equal to acidemia. If the pCO2 is > 65 and the HCO3 is > 22, then respiratory acidosis is present. This is the scenario with the infant in the case. Metabolic acidosis is present if the pCO2 is < 65 and the HCO3 is < 17 and a mixed pattern is if the pCO2 is > 65 and the HCO3 is 17. It is recommended that blood gases be sent on all neonates with low Apgar scores to distinguish acidemia from hypoxia or other causes that might result in low scores.

Acidemia should not be confused with asphyxia or hypoxic brain injury. Asphyxia is an imprecise term and should not be used. Apgar scores alone should not be used to determine if hypoxic brain injury has occurred. Hypoxic brain injury requires all of the following:

- An umbilical artery pH < 7.0
- Apgar score of 0-3 for more than 5 minutes
- Neonatal neurologic sequelae such as coma, hypotonia and/or seizures
- Multi-organ system dysfunction

2. What are the important first steps in caring for any newborn?

Typical newborn care includes suctioning of normal secretions from the oropharynx, drying the infant, assessing an Apgar score and providing warmth. The umbilical cord should of course be clamped and cut. Vitals signs should be assessed and breastfeeding initiated within the first hour of life if that is the mother’s choice for feeding
Additional considerations include parenteral vitamin K to prevent hemorrhagic disease of the newborn and prophylactic application of antibiotic ointment to both eyes to prevent gonococcal ophthalmia neonatorum. The infant’s voiding patterns should be observed over the first few hours of life to assess for possible obstruction in the genitourinary tract.

3. Though this infant needed no additional resuscitation, what signs and symptoms would prompt you to offer additional interventions? What additional interventions would you offer?

Any infant demonstrating difficulty with respirations or a heart rate less than 100 may require additional care including deep suctioning of the nasopharynx and/or oropharynx, stimulation to promote crying, supplemental oxygen or in severe cases, resuscitation with chest compressions, epinephrine, positive pressure ventilation, fluid supplementation or ultimately respiratory support in the form of intubation. Severe acidosis, anemia and narcotic depression are other causes of difficulty with respiration. These should be evaluated and corrected.

REFERENCES


ACOG Committee Opinion 326, Inappropriate Use of the Terms Fetal Distress and Birth Asphyxia, December 2005.