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International Lactation Consultant Association

Independent Study Module

Hypoglycemia in the Breastfeeding Newborn

Sallie Page-Goertz, MN, CPNP, IBCLC

2 L-CERPs and contact hours • Expires March 1, 2010

Learning Objectives:

Upon completion, the learner will be able to:

- Identify risk factors for hypoglycemia in the newborn infant.
- List strategies for prevention of hypoglycemia in the newborn.
- Describe breastfeeding management for the hypoglycemic infant.
- Discuss recommendations for glucose screening.

Module Materials:

Monograph: *Hypoglycemia in the Breastfeeding Newborn*

Study Module Questions

Study Module Answer Sheet and Evaluation Form

This module expires on March 1, 2010. Answer sheets must be received by that date to receive continuing education credit. Return to: ILCA Continuing Education, Suite 102, 1500 Sunday Drive, Raleigh, North Carolina 27607 USA.

Hypoglycemia in the Breastfeeding Newborn

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Introduction

Concern about hypoglycemia in the newborn infant is a common issue. Subsequent neurologic development may be adversely affected in children experiencing hypoglycemia in the newborn period. Yet, there are ongoing controversies regarding how to define hypoglycemia, when to treat an infant who may be hypoglycemic, and in some instances, how to manage breastfeeding in the face of hypoglycemia. Glucose physiology in the fetus and newborn will be reviewed, issues and controversies related to the definition of hypoglycemia and screening for hypoglycemia will be discussed, and recommendations for the management of the breastfed infant who is diagnosed to have hypoglycemia will be delineated.

Glucose Physiology in the Fetus and Newborn

Intrauterine life is dependent on the metabolic interactions between the mother and the fetal-placental unit. The fetus receives continuous glucose via the umbilical cord during the third trimester. However, no maternal insulin passes through the cord. The fetal liver accumulates glycogen stores, primarily during the third trimester. These stores are then available to the infant as an energy source in the immediate post partum period. Fetal insulin production does not respond rapidly to acute changes. Infants born prematurely have reduced glycogen stores, increasing their risk of hypoglycemia.

At birth, the communication between mother and fetus ceases, demanding rapid adaptation of cardiovascular, respiratory and metabolic systems. The enzymes for breakdown of glycogen and for glucose synthesis undergo induction. However, they are not fully functioning at birth. There is a lag time between cessation of maternal glucose supply and development of the infant's capacity for glucose synthesis. Therefore, glucose levels are lowest in the first 2 to 3 hours after birth. Levels then rise as the enzyme systems for glycogen breakdown and glucose synthesis begin to operate. This fall and rise of glucose occurs in the first hours of life irrespective of feedings.

Pathogenesis of Hypoglycemia

The fetal glucose level is 60 to 80% that of the maternal level. At birth, the infant's glucose level reflects the maternal level immediately prior to birth. There are many reasons why a particular newborn may experience hypoglycemia. Two basic concerns are the excess utilization of glucose with rapid depletion of glycogen stores, and inadequate production of glucose or delivery of substrate – fuels that can be metabolized for energy such as glucose, ketone bodies, and lipids. Of particular note is that intervals up to 8 hours between feedings are NOT associated with hypoglycemia in the normal newborn infant.

Excess utilization of glucose can be due to several factors:

- Excess insulin: Chronic maternal hyperglycemia, as seen in a mother with poorly controlled diabetes, results in hypertrophy of fetal islet cells and enhances beta cell maturation. This is why infants of diabetic mothers have a higher risk of hypoglycemia after birth (Agrawal, 2000).
- Cold stress seen with delay in skin-to-skin contact, ineffective warming or drying after birth, increased muscle activity, separation from mother, or crying.
- Anaerobic metabolism: Delayed feedings (more than 7-8 hours in a term newborn without risk factors) or inadequate glycogen storage
- Inborn errors of metabolism.
- Acute brain injury.

Inadequate production of glucose, or substrate delivery in the newborn may be observed in the following situations:

- Inadequate or delayed feedings
- Aberrant hormonal regulation of glucose or lipid metabolism
- Transient immaturity of critical metabolic pathways
- Deficient metabolic reserves of glucose precursors
- Deficient brain glucose transporters
- Suppression of gluconeogenesis, glycogenolysis, and hepatic glucose release

Defining Hypoglycemia

One of the challenges to providers of newborn care is deciding whether an infant is in fact hypoglycemic. There are no universally accepted standards for a serum glucose level that is considered to accurately define hypoglycemia in the newborn infant. There are problems with determining specific glucose levels that signal concern. This is due to several factors:

- 1) One must use whole blood, serum or plasma for accurate measurement of blood glucose levels.
- 2) There are problems with all screening methodologies.
- 3) Studies examining glucose levels and infant outcome have not used consistent methodologies or accounted for important variables such as feeding method.

Several criteria have been used to assess the incidence of hypoglycemia in a variety of infant populations. They include:

Heck and Erenberg (1987)

<30 mg/dl (1.6 mmol/L) at 0-24 hours of age

<40 mg/dl (2.2 mmol/L) at over 24 hours of age

Srinivasan et al (1986)

<35 mg/dl (1.9 mmol/L) at less than 3 hours of age

<40 mg/dl (2.2 mmol/L) at 3-24 hours of age

<45 mg/dl (2.5 mmol/L) at over 24 hours of age

A recent systematic review of current information on hypoglycemia in the term infant included the following consensus opinion of normal values of blood glucose levels for neonates listed below (Hewitt, 2005).

Age of infant	Hypoglycemia	
0-3 hours	< 36 mg/dl	(2.0 mmol/L)
3-6 hours	< 25 mg/dl	(1.4 mmol/L)
6-24 hours	< 30 mg/dl	(1.7 mmol/L)
24-48 hours	< 40 mg/dl	(2.2 mmol/L)
> 48 hours	< 45 mg/dl	(2.5 mmol/L)

The policy statement of the American Academy of Pediatrics' Committee on the Fetus and Newborn (1993) does not define levels at which intervention is needed.

Incidence of Hypoglycemia

It is hard to determine the incidence of hypoglycemia, as the definition of hypoglycemia is nebulous. If <30 mg/dl (1.6 mmol/L) is used as a definition, incidence of hypoglycemia in term infants who are not infants of diabetic mothers ranges from 0.4% - 11.4%. In a study using a dextrostix value of <40 mg/dl (2.2 mmol/L), infants with no risk factors did not have hypoglycemia, while 28.6% of infants with at least one risk factor had hypoglycemia (Sexson, 1984).

Using Srinivasan's criteria cited earlier (see "defining hypoglycemia") Holtrop (1993) reported that 8.1% of large for gestational age (LGA) infants and 14.7% of small for gestational age (SGA) infants experienced hypoglycemia. Hypoglycemia occurred in SGA babies on average at 6.1 hours of age, while LGA babies were on average 2.9 hours old. This suggests the need to monitor SGA infants for a longer time after birth. Of more importance, based on the glucose level that appears to be related to symptoms in the individual infant, is monitoring the infant, assessing glucose levels and symptoms, and then planning intervention.

Hoseth and colleagues (2000) studied blood glucose status specifically related to feeding method. They evaluated a population of exclusively breastfeeding infants who were healthy, term, and appropriate size for gestational age. They checked blood glucose levels at regular intervals in the first four days of life and found that blood glucose levels were significantly lower during the first 24 hours compared to later. None of the infants had symptoms of hypoglycemia at any time.

De Rooy and Hawdon (2002) looked at factors affecting metabolic adaptation in term infants who were either small or large for gestational age. Feeding status of the infants in the study differentiated between exclusive breastfeeding, formula supplemented breastfeeding, and exclusive formula feeding. They concluded that the neonate's ability to generate ketone bodies when blood glucose values are low depends more on effective breastfeeding than on size for gestational age. Ketone bodies are thought to provide an alternative energy source for the neonatal brain. They further suggested that LGA and SGA infants should not receive routine formula supplementation.

Screening for Hypoglycemia

Universal screening for hypoglycemia is neither required nor recommended by either the AAP (1993), or the Academy of Breastfeeding Medicine (2006). However, infants having any risk criteria should be screened. The best age for performing screening tests is not known. In fact, it is probably different for each child as evidenced by the difference in ages for glucose nadir seen in LGA and SGA infants (DeRooy and Hawdon, 2002).

Screening methods are flawed for several reasons. Reagent strips are of limited accuracy in newborns. Visual interpretation of test strip results is highly inaccurate and should not be done. Reflectance meter results are altered by hematocrit, resulting in false low readings at >55% and false high readings at <34%. Results from reagent strips are more likely to be falsely high, and there is a variance of +/- 15 mg/dl from test to test. Further, accurate timing of when the reading is made is critical. Abnormal screening values must be confirmed by plasma or serum glucose levels.

Risk Factors for Development of Hypoglycemia in the Newborn

There are many risk factors for hypoglycemia which can be assessed both prenatally, intrapartally, and at birth. Some of these risk factors can be ameliorated, and will be discussed under prevention.

Infant risk factors include:

- large for gestational age (> 4000 gms) – a sign that the mother is diabetic
- small for gestational age (< 2500 gms) – a sign of prematurity or intrauterine growth retardation, and resultant decreased glycogen stores
- discordant (smaller) twin
- prematurity
- cold stress / hypothermia
- respiratory distress / post-asphyxia
- polycythemia / hyperviscosity
- presence of endocrine abnormalities or inborn errors of metabolism
- delayed first feeding (this is listed as a risk factor by some authors, but not by others in view of physiology discussed earlier)

Maternal risk factors include:

- maternal diabetes, particularly when not well controlled
- maternal weight gain
- smoking
- gravidity / parity
- hypertension

Intrapart factors include:

- fetal distress
- length of labor
- anesthesia
- maternal glucose status during labor and delivery
- intravenous fluids with dextrose only
- lack of maternal oral intake
- maternal medications that affect glucose status, e.g., tocolytics

- cool room temperature
- separation of the infant from the mother – contributing to cold stress, increased muscle activity, and therefore, increased metabolic needs

Symptoms of Hypoglycemia in the Term Infant

Symptoms of hypoglycemia in the term infant may be subtle. Many other neonatal problems may also cause the signs observed in the infant with hypoglycemia. To determine whether a particular symptom is associated with hypoglycemia, it is helpful to consider how to determine if low blood glucose is the cause of observed symptoms. First, a clinical sign must be present. Second, glucose levels, as measured accurately, are low. Third, the signs resolve once normoglycemia is established.

Thus, if one is concerned about a symptom in a baby, and wonders whether it is due to low blood glucose, an accurate measurement of the glucose level must be obtained at the time the symptoms are present. If the level is indeed low, the symptom must disappear with establishment of normal blood sugar in order for hypoglycemia to exist. If the symptom continues after blood sugars are normal, the observed symptom is not indicative of hypoglycemia in this infant. If the clinical signs are indeed caused by hypoglycemia, they will be reversed with correction of plasma glucose levels.

Clinical signs associated with hypoglycemia in the term infant include:

- abnormal level of consciousness
- irritability
- lethargy
- stupor
- abnormal vital signs
- tachypnea
- hypothermia
- abnormal tone
- hypotonia / limpness
- tremor
- seizures
- poor sucking
- diaphoresis

Prevention of Hypoglycemia in the Newborn Infant

Many of the risk factors for hypoglycemia can be eliminated or reduced with appropriate labor, delivery and early newborn care practices (WHO, 1997). The infant's metabolic adaptation to extrauterine life involves an energy triangle – temperature regulation, oxygenation, and maintenance of normal blood sugar levels (Aylott, 2006). Attention to each of these areas contributes to the stability of the others.

Labor management of the mother profoundly affects the newborn's glycemic status. If intravenous fluids are used for the mother, it is preferable to choose balanced electrolyte solutions such as lactated ringer's or dextrose with normal saline, rather than dextrose and water only. When mothers are infused with more than 25 grams of glucose per hour in the two hours prior to delivery, their infants have significantly lower blood glucose levels at two hours of age (DiGiacomo and Hay, 1992). Avoidance of dextrose-only solutions reduces the chance of causing maternal glucose levels to be abnormally high. High maternal blood glucose levels lead to hyperinsulinism in the infant, who at birth does not have sufficient glucose immediately available for the increased circulating insulin.

A cold baby uses more energy and is more likely to become stressed and hypoglycemic. A neutral thermal environment in the birthing area is essential to the avoidance of cold stress in the newborn infant. Cold stress profoundly increases the infant's metabolic demands at a time when glucose is marginally available to the child. In addition to assuring a neutral thermal environment, other measures that reduce the risk of cold stress to the newborn include towel drying and maintaining skin-to-skin contact with the mother (Christensson, 1992; Chiu, 2005; Fransson, 2005). Separation of the infant from the mother increases the risk of cold stress.

Appropriate breastfeeding management (ILCA, 2005; WHO, 1997) is critical to the well being of the infant. Case reports demonstrate that inadequately breastfed babies continue to be at risk for hypoglycemia even after hospital/birthing center discharge (Moore, 1999).

Management of Hypoglycemia in the Breastfed Newborn

There is no clinical evidence that asymptomatic hypoglycemic infants will benefit from treatment. Based on currently available evidence for term infants, recommendations for operational thresholds, that is, the concentration of blood glucose at which one should consider intervention, have been published (Cornblath et al, 2000). However, it is noted in the context of their discussion that breastfed term infants have lower blood glucose concentrations than formula-fed infants, while also having higher concentrations of ketone bodies. This data suggests that these recommendations may not be appropriate for the

term breastfed infant who may tolerate lower plasma glucose levels without significant clinical signs (Cornblath et al, 2000).

Thresholds for intervention (Cornblath et al, 2000)

- Infant with risk factors, but no clinical signs < 36 mg/dL (2 mmol/L)
- Infant with clinical signs < 45 mg/dL (2.5 mmol/L)
- IV glucose indicated < 20 – 25 mg/dL (1.1-11.4 mmol/L)

For the infant with low glucose levels who is not symptomatic, the opportunity to breastfeed is the preferred initial intervention. If glucose levels remain low, and the child is capable of suckling effectively at the breast, provide supplemental calories via a nursing supplementation device. For symptomatic infants, IV glucose is encouraged (Eidelman, 2001; ABM, 2006). Encourage frequent breastfeeding after relief of symptoms. Gradually decrease the IV rate as feeding is resumed. Check glucose levels before each feeding until intravenous fluids are discontinued.

An infant who is incapable of sustained suckling at the breast will need to be fed away from the breast. For the term infant, there are no data currently available to guide the best choice for feeding away from the breast, i.e., cup, bottle, finger feeding, or nasogastric feeding. Each infant's specific capabilities and needs must be assessed. If the infant is not interested in suckling, oral feeds may not be safe. "Forced" oral feedings place the infant at risk for aspiration. In this case, a nasogastric tube feeding or intravenous glucose is probably preferred.

The choice of supplement depends in part on the availability of expressed mother's milk. Expressed colostrum is the first choice for supplement. The mother's milk enhances gluconeogenesis and energy balance (Eidelman, 2001). If that is not available, the second choice for supplement is pasteurized human milk. Human milk substitute needs to be used when human milk is unavailable. The choice of substitute depends on family history related to milk tolerance and diabetes. In most cases, cow milk based formula is the appropriate choice. If a family has a positive history of cow milk protein allergy or diabetes, non-cow milk based formula preparations may be preferred. The use of dextrose water is discouraged. Glucose water increases insulin secretion and delays initiation of the natural gluconeogenesis and ketogenic homeostatic processes. If glucose water is used, the infant may have fluctuating glucose levels, with rebound hypoglycemia being a problem. (Eidelman, 2001; Wight, 2006).

A summary of the best approach to the breastfed infant with hypoglycemia is based on recent guidelines by Wight, Marinelli, and the Academy of Breastfeeding Medicine, 2006. Healthy term neonates do not develop symptomatic hypoglycemia as a consequence of underfeeding. Underlying illness must be excluded. Routine monitoring of blood glucose in asymptomatic, term infants is unnecessary.

Monitoring of infants of diabetic mothers should begin within 30 minutes of delivery. Monitoring of infants in other risk categories should begin no later than two hours of age. Monitor before feeds, and every two to four hours until glucose levels are maintained with routine breastfeeding. Minimize hypoglycemia by early and frequent breastfeeding, even for an infant who meets the criteria for glucose monitoring. Encourage skin-to-skin contact with the mother to facilitate stable temperature and blood glucose.

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Hypoglycemia in the Breastfeeding Newborn

Review Questions

- Which of the following infants should be screened for hypoglycemia?
 - Infants who weigh between 2800 grams and 4000 grams
 - Infants who are post dates
 - Infants of diabetic mothers
 - All infants should be routinely screened
- Which of the following is the best way to approach the initial feeding of a breastfeeding infant with hypoglycemia?
 - Cup feed colostrum or formula
 - Bottle feed colostrum or formula
 - Gavage feed colostrum or formula
 - Feed the baby at the breast
- In which situation should a breastfed infant with hypoglycemia receive supplementation?
 - The infant's blood sugar remains low after initial breastfeeding.
 - All infants who have risk criteria should be supplemented.
 - Colostrum is sufficient, and supplementation of breastfed hypoglycemic infants is never necessary.
 - The mother is planning to introduce formula at 6 weeks.
- Which of the following is a maternal risk factor for infant hypoglycemia?
 - Adolescent age
 - Illegal drug use
 - Hypertension
 - HIV/AIDS
- Which of the following is a perinatal risk factor for infant hypoglycemia?
 - Use of balanced intravenous fluids for the mother during labor
 - Induction of labor
 - Separation of mother and infant
 - Short labor
- Dextrose water supplementation is avoided due to which concern?
 - It requires the use of an artificial nipple/teat to be offered to the infant.
 - Rebound hypoglycemia is more likely to occur.
 - There is no fat in dextrose water.
 - There are insufficient calories in dextrose water.
- Which of the following statements regarding hypoglycemia in newborn infants is true?
 - There is no good tool for bedside glucose screening of newborn infants.
 - There is a consensus on blood glucose levels that require intervention.
 - The wealth of data regarding hypoglycemia in breastfed newborns dictates current management strategies.
 - Screening of asymptomatic infants is important.

Case Study of Jennifer and Alyssa (Questions 8-13)

Jennifer is an insulin dependant diabetic with poor control of her blood glucose levels. She had a long painful first phase of labor and did not eat for 18 hours. At 18 hours an IV of dextrose and water was hung due to Jennifer's hypoglycemic state. Labor augmentation was begun, but after only 30 minutes Alyssa's fetal heart rate dropped to 60 beats per minute and did not recover. Jennifer was taken to the surgical suite and delivered by Cesarean section. Her daughter, Alyssa, was immediately placed on the radiant warmer bed.

- What is the LEAST likely reason for Alyssa to be hypoglycemic?
 - Jennifer had a long and difficult labor.
 - Alyssa was kept warm by the radiant warmer.
 - A dextrose IV solution was used during the last two hours of labor.
 - Alyssa experienced fetal distress during her mother's labor.

9. Alyssa is born at 42 weeks and weighs 2500 gm. What is the best time to begin monitoring Alyssa for hypoglycemia?
- At 2 hours post birth
 - At 4 hours post birth
 - Immediately post birth
 - Within 30 minutes post birth
10. At 2500 grams and 42 weeks gestation, Alyssa would be termed an SGA infant. For what time period should Alyssa be monitored for hypoglycemia?
- A shorter period of time than an LGA infant
 - A longer period of time than an LGA infant
 - The same period of time as an LGA infant
 - Post term SGA infants need not be monitored
11. When tested at 1 hour of age Alyssa's plasma glucose is 40 mg/dl. At 3 hours post birth Alyssa's plasma glucose level is 32 mg/dl. What does Alyssa's fall in plasma glucose level indicate?
- A signal for immediate intervention
 - Typical of a infant whose mother is an insulin dependant diabetic
 - The result of ineffective initial breastfeeding
 - Probably a normal adjustment to extra-uterine life
12. At 6 hours of age Alyssa begins to have tremors and her axillary temperature falls to 96.8 F (36C). The lactation consultant is concerned that Alyssa might be hypoglycemic. What can confirm that her symptoms are due to hypoglycemia?
- The appearance of two clinical signs associated with hypoglycemia
 - A low plasma glucose level
 - Presence of hypoglycemia with a return to normoglycemia after treatment
 - Improvement in plasma glucose levels after treatment
13. At 12 hours of age, Alyssa's plasma glucose level measures 27 mg/dl. No symptoms of hypoglycemia are noted. What is the feeding recommendation for Alyssa?
- Encourage her to breastfeed
 - Give her a small amount of formula
 - Give her a small amount of glucose water mixed with colostrum
 - Give her a Glucose IV and do not breastfeed
14. It is 11 pm and Molly is exhausted and in pain. Her infant, Matthew, is fretful and will not breastfeed. Molly tries undressing Matthew to see if he will breastfeed if he is more awake. Matthew continues to fret and Molly starts to cry. As the nurse is helping Molly, she notices that Matthew has become cold. What is the best strategy for this couplet?
- Place Matthew in the nursery under a radiant warmer and have the nurse feed him pumped colostrum in a syringe
 - Give Molly pain medication, double wrap Matthew in baby blankets and continue to assist Molly to breastfeed
 - Give Molly pain medication, put Matthew skin to skin with her and place a blanket over the two of them
 - Give Molly a strong pain reliever, wrap Matthew in a warm blanket and have the father feed him a bottle of formula
15. Callie Rose is a full term infant weighing 3900 grams. Her mother, Megan, gave birth vaginally without pain medication. Callie Rose breastfed at 50 minutes of age. Since then mother and baby have been asleep for 7 hours. The nurse is concerned about Callie Rose becoming hypoglycemic. What is the MOST likely reason the lactation consultant is not concerned about the baby being hypoglycemic?
- Callie Rose is a full term, AGA infant.
 - Callie Rose had 1 wet and 1 soiled diaper soon after birth.
 - Callie Rose fed well at the breast when she was 12 hours old.
 - Callie Rose can tolerate a 7-hour interval between feeds.
16. Baby Aiden received a bath 90 minutes after he was born. He became very cold and his blood sugar dropped. He was kept in the nursery for several hours to warm up and was not allowed to breastfeed until his breathing rate normalized. What was the most likely reason for Aiden's hypoglycemia?
- He was separated from his mother for several hours.
 - He had a genetic defect that caused rapid respiration.
 - He became cold stressed from the bath.
 - He was not breastfed for several hours post birth.

17. An infant's glucose levels are at their lowest in the first 2 to 3 hours after birth. What is the reason for this low level?
- The stress of the birth process uses up the infant's energy stores.
 - The infant uses energy stores moving from the warm uterine environment to the colder extra-uterine environment.
 - Mothers typically produce very little colostrum in the first few hours.
 - The enzymes for breakdown of glycogen and glucose synthesis are not functioning fully at this time.
18. Mrs. Johnson has a history of hypoglycemia. Usually she eats a protein food every 4 hours, but she has been drinking only water during labor because she is nauseous. At the time of birth, she is hypoglycemic. What would be the expectation with her full term, AGA infant?
- He may be hypoglycemic because the mother is hypoglycemic.
 - He will be hyperglycemic because glucose transfers to the infant, but not insulin.
 - He will be normoglycemic because he is a healthy normal newborn.
 - He will be hyperglycemic and then rapidly hypoglycemic.
19. Which of these mechanisms is NOT a reason for hypoglycemia in a newborn?
- High infant glucose level at birth
 - Delayed skin-to-skin contact causing cold stress
 - Delayed feedings (less than eight hours)
 - Excess infant insulin
20. Sara is the 10-pound infant of a gestational diabetic mother. Her values at two hours are:
 Blood glucose = 35 mg/dl (reagent strips)
 Blood glucose = 37 mg/dl (reflectance meter)
 Plasma glucose = 30 mg/dl
 What does the difference in these values reflect?
- The level of skill of the person performing the test
 - How warm the infant's foot was when the blood was obtained
 - Whether the machines used were correctly calibrated
 - Greater accuracy of plasma glucose levels
21. Kayla is the 7-pound infant of a mother with hypertension. Kayla has tremors, is irritable, and refuses to breastfeed. The lactation consultant who is also a nurse suspects Kayla is hypoglycemic. When the plasma glucose level is checked it reads 20 mg/dl. The infant is given IV glucose and the plasma glucose rises to 40 mg/dl. Her tremor is gone and she is rooting. What can be stated about the meaning of her symptoms?
- Symptoms had nothing to do with her glucose level.
 - Symptoms were indicative of hypoglycemia as they resolved with treatment, and establishment of normoglycemia.
 - A return to normoglycemia is not necessary to diagnose this infant.
 - Hypoglycemia cannot be confirmed, as the plasma glucose level has not yet become normoglycemic.
22. Madison is a 2200 gm, 38-week-old infant. What is the LEAST important factor in assessing Madison's metabolic adaptation?
- Weight for gestational age
 - Ability to produce ketone bodies
 - Ability to effectively breastfeed
 - Being exclusively breastfed
23. Latesha is a 2300 gm full term infant. What is the most important factor in whether she develops hypoglycemia?
- Latesha's status as small for gestational age
 - Latesha's ability to produce ketone bodies
 - Whether Latesha is supplemented with formula
 - How soon after birth Latesha is breastfed

**ILCA Independent Study Module —
Hypoglycemia in the Breastfeeding Newborn**

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Answer Sheet

Approved for 2 L-CERPs/contact hours (60-minute units)
Cost: US\$ 20 (ILCA member) US\$ 40 (Nonmember)

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Evaluation: Please circle the appropriate response below.

Disagree		Agree			
1	2	3	4	5	The module's content was clear and relevant.
1	2	3	4	5	Test questions were appropriate to the material presented.
1	2	3	4	5	My personal objectives were met.
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Circle the number of hours it took to complete the module: 1 2 3 4 5

Answers: Record your answers to the questions below by circling the letter that corresponds to your answer.

1.	A	B	C	D	13.	A	B	C	D
2.	A	B	C	D	14.	A	B	C	D
3.	A	B	C	D	15.	A	B	C	D
4.	A	B	C	D	16.	A	B	C	D
5.	A	B	C	D	17.	A	B	C	D
6.	A	B	C	D	18.	A	B	C	D
7.	A	B	C	D	19.	A	B	C	D
8.	A	B	C	D	20.	A	B	C	D
9.	A	B	C	D	21.	A	B	C	D
10.	A	B	C	D	22.	A	B	C	D
11.	A	B	C	D	23.	A	B	C	D
12.	A	B	C	D					