PROTEIN & THE PRETERM INFANT

Featuring :: Bonnie Gahn, MSN, MA, RNC-NIC, and Melody Thompson, MS, RD

TRANSCRIPT

Maura: As you know, the final months and weeks of pregnancy are some of the most important for neonatal development. It’s the window of time when vital organs like the brain and lungs are in that final stage of maturity. Infants who are born prematurely, especially before 32 weeks gestation, can be at risk for serious health complications. That’s why it’s absolutely critical to immediately provide them with good nutrition.

Maura: I’m Maura Bowen, podcasting for Abbott Nutrition Health Institute, and I’m here today with two people I like and respect very much—Bonnie Gahn (MSN, MA, RNC-NIC) and Melody Thompson (MS, RD, LD). They’re here to talk about the role protein can play in nutrition for the preterm infant. And they’ve built their careers through several years of working clinically in the NICU. Ladies, it’s an honor and a privilege to welcome you to the ANHI podcast today; thanks for joining us!

Bonnie: Thank you, Maura. It’s a pleasure being here with you and a real honor to have this opportunity to discuss neonatal nutrition needs with my friend and colleague, Melody.

Melody: Likewise, I’m glad to be here.

Maura: Before we get started, I’m going to ask you tell us a little about yourselves: Who you are, what you do, and why you do what you do.

Bonnie: In my current position, I am the Manager for Nursing Education through Abbott Nutrition Health Institute. Historically, I have spent over 30 years in the NICU in a variety of positions, including staff nurse and Clinical Nurse Specialist. I am also Adjunct faculty at The Ohio State University College of Nursing. And I continue to do what I do because I love babies and families and nutrition.

Melody: I am a Senior Research Scientist at Abbott and what I draw on every day in my work here at Abbott is my 20-year career as a neonatal nutritionist at Nationwide Children’s Hospital. Thinking of providing the best nourishment to each baby is what motivates me every day.

Maura: Now: I’d like to mix up our discussion format a little today, because I think our listeners will get more out of hearing you two talk directly than they would if I asked you a bunch of questions. Do you think you’re up for that approach?

Bonnie: Sounds good.

Melody: Let’s do it!

Maura: I’ll launch the first question to kick things off, then you two can take over. Let’s start with human milk, which is always a good place to start. The American Academy of Pediatrics considers breastfeeding and human milk to be the normative standard for infant feeding and nutrition because it helps to protect infants from disease and improve
feeding and development outcomes. Since we’re focusing on the tiniest babies today, so can you speak to the benefits, specifically, for preterm infants?

**Bonnie:** Mother’s own milk is the first choice for all neonates including preterm infants. However, when it is unavailable or in short supply, pasteurized donor breast milk offers a safe alternative and is considered the next best choice. We also know that human milk, both mom’s own milk (MOM) and donor milk (DM), is protective against gut microbiota alterations associated with necrotizing enterocolitis (NEC) and feeding intolerance among preterm infants.

**Bonnie:** Acknowledging that human milk is preferred for LBW infants, there have been several recent studies in the US and Europe, where the evidence supports the concept that MOM has significant beneficial effects on the diversity of the gut microbiome with “good” bacteria, along with consistent weight and length growth versus DM.

**REFERENCES**


**Melody:** Bonnie – I love that you started with mom’s own milk – a unique fluid that only that mom can provide. Mom’s own milk or donor milk – is an amazing fluid that helps in maturation of the infant’s gastrointestinal tract. However, human milk is not able to supply the high nutrient needs that the infant would receive through the placenta in the third trimester. We know that, particularly, protein and minerals are limiting nutrients in human milk that must be provided in other ways.

**REFERENCES**

(Ziegler EE. Human Milk – A Valuable Tool in the Early Days of Life of Premature Infants. Front Pediatrics 2019;7:266.)

**Bonnie:** Let’s talk more about protein. I remember on NICU rounds when I would mention that a baby wasn’t growing well in length, we would immediately look at the baby’s intakes and talk about protein needed for lean body mass.

**Melody:** That’s right. We learned this from looking at fetal growth and accretion of protein in utero. This tells us that preterm infants need about 3.5 to 4.5 grams of protein for each kilogram of body weight per day. That is an incredible amount of protein. You and I, as adults, need about 0.8 g protein/kg/d. If we needed 3.5 – 4.5 g protein/kg/d, we would need to eat about four times as much protein as we need now. If we got all of our protein from one food... that would calculate to drinking 39 eight-ounce glasses of milk a day – or 2 ½ one pound steaks each day or six chicken breasts or 11 chicken thighs a day. Wow – can you imagine that?

**REFERENCES**

These calculations are based on the following: The average weight of US women

(https://www.cdc.gov/nchs/fastats/body-measurements.htm is 170 pounds divided by 2.2 kg per pound = 77 kg x 4 g pro per kg = 309 g protein per day.)
**Bonnie:** If babies don’t get enough protein, we see slower growth rates – in body and brain. And, even when they get enough protein, they also need calories for proper protein utilization... otherwise the protein could be used as an energy source. So, how do health care professionals know what feeding will give infants enough protein?

**Melody:** As a rule of thumb, health care professionals can look for products that give 3 to 3.6 grams of protein per 100 Calories. I’m referring to fortified human milk – using commercially available human milk fortifiers – or preterm formulas. These products are labelled with the amount of protein per 100 Calories. And when we feed babies at 120 Calories per kilogram per day, feedings with 3 to 3.6 g protein/100 Cal give 3.6 to 4.3 g protein/kg/d. So that’s right in the range we’re looking for.

**Bonnie:** Thank you, Melody. Those numbers really help. So, in addition to what we are feeding our infants, I think we’ve also learned a lot about when to feed. There’s a lot of evidence that talks about how it’s best to start meeting calorie and protein goals very early... within the first few days, if possible. Stephens’ research showed that first-week protein and energy intakes are associated with 18-month developmental outcomes in extremely low birth weight infants. Specifically, during week 1, every 10 kcal/kg per day were associated with a 4.6-point increase in the Bayley Mental Development Index and each gram per kilogram per day in protein intake was associated with an 8.2-point increase in the Mental Development Index. So early nutrient intake is quite important. But, what if you can’t provide enough protein?

**REFERENCES**


**Melody:** So, Bonnie, that makes me think of, how do you know if we’re providing enough protein. And a quick look at the infant’s BUN—the blood urea nitrogen value—can be used as a screening tool. And if the baby’s BUN is below 9 milligrams per deciliter, that baby may need more protein, and that would be worth discussion on rounds.

**Melody:** Now, Bonnie, to your question, what if you can’t get enough protein in the base feeding being given? Well, you have a few choices. You could increase the volume of that feeding, or you could use a higher protein feeding, or you could consider a protein supplement. This particularly happens when infants are fed fortified donor milk which is known to have lower protein than mother’s own milk in the early weeks. A protein supplement should ideally be a commercially sterile source of high-quality protein that is well-tolerated.

**Melody:** My experience is that using fortified mother’s milk at 120 Cal/kg/d or more gives the baby the best source of high-quality nutrition – and is associated with good growth outcomes.

**Bonnie:** NICU parents want to do everything they can to help their infant. So, as healthcare professionals, our efforts at encouraging mothers to pump, provide skin-to-skin care, and just being with their baby ...is so supportive of giving this wonderful base of nutrition, and having them eventually feed their babies directly from their breasts.

**Melody:** Bonnie, I couldn’t have said that better. If parents want to know more about the purpose of human milk fortifiers, there is a great infographic on ANHI.org.

**Maura:** Great! You made my job so easy. Ladies, thank you so much for your time today. This was fabulous information. You’re welcome on our podcast anytime, and I hope you’ll come back.

**Maura:** And for our listeners, thank you for joining us today. Be sure to visit anhi.org for more nutrition science education and resources, including more podcasts, which you can find on anhi.org under RESOURCES, and the PODCASTS & VIDEOS...or, by clicking the “COMMUNITY” link on the ANHI.org homepage to find podcasts there, as well.